



COMMONWEALTH of VIRGINIA

Office of the Governor

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Assistant to the Governor
for Commonwealth Preparedness

July 1, 2006

Greetings,

I am very pleased to provide to you the Fiscal Year 2007 Commonwealth of Virginia Strategic Plan for Statewide Communications Interoperability (Statewide Plan). Through the combined support of the Warner and Kaine Administrations in, Fiscal Year 2006, Virginia made remarkable progress towards the improvement of statewide communications interoperability. As a result, Virginia is currently being used as a best practices model for state interoperability planning by the Department of Homeland Security's (DHS) SAFECOM Program. This third version of the Statewide Plan shows the Commonwealth's continued commitment to the public safety practitioner community and marks the next step towards achieving the 2015 vision of improved communications interoperability on a local, regional, state and federal level.

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The State Interoperability Executive Committee (SIEC), State Interoperability Advisory Group (Advisory Group) and my office, the Commonwealth Interoperability Coordinator's Office (CICO), collaborated to refine and enhance the FY 2006 Statewide Plan in response to Virginia Code Section 9.1-1200 which requires the update and implementation of the Plan annually. As a result, this Statewide Plan reflects new and on-going initiatives throughout the Commonwealth of Virginia that will affect interoperability in the coming years.

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In FY 2006, the SIEC and Advisory Group ably represented the local public safety community, drove the planning process, and played an integral role in the implementation of the initiatives contained in the Statewide Plan. In FY 2007, we hope to continue our work with state agencies to ensure the initiatives contained in the Statewide Plan are implemented fully and effectively. We continue our commitment to coordinate current projects throughout the Commonwealth, increase awareness, and address challenges across disciplines, localities, and state agencies.

As we move towards the July 1, 2015 deadline for state agencies and localities to achieve consistency with the Statewide Plan we must remain dedicated and continue to improve the ability to communicate between disciplines and across jurisdictional boundaries. With help from all practitioners statewide, we will achieve our 2015 vision and continue to be a model and positive example of the impact of effective statewide interoperability.

Sincerely,

A handwritten signature in dark ink, appearing to read "Chris Essid".

Chris Essid
Commonwealth Interoperability Coordinator

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Introduction

Comment [MSOffice1]: Acknowledgement of Governor Kaine's support inserted in final paragraph of this section

The lack of voice and data communications interoperability continues to represent a significant challenge for public safety responders. After decades of experience with this issue, it is clear to first responders and other emergency organizations that public safety communications and interoperability cannot be solved by any one entity. It requires a partnership among local, state and federal public safety organizations, and industry.

The First Responder Sub Panel, which was chaired by Senator Stolle of Governor Warner's Secure Virginia Panel, identified radio communications interoperability - the ability of first responders to communicate with each other over divergent radio systems - as a critical post-9/11 priority for Virginia's first responders in 2003. In response to this directive the Secure Virginia Panel formed the Interoperability Working Group, which was composed of first responder participants from fire, rescue, and law enforcement agencies throughout the Commonwealth, to plan for improved communications interoperability.

The first step towards improved communications interoperability was the development of a strategic plan. The Commonwealth and SAFECOM¹, a federal program managed by the Department of Homeland Security (DHS), entered into a Memorandum of Understanding (MOU) in 2004 to develop the FY 2005 Strategic Plan for Statewide Interoperable Communications. Through this partnership, the Commonwealth adopted the SAFECOM practitioner driven approach to provide a forum for responders to drive statewide planning. The National Institute of Justice (NIJ) also came to Virginia's aid by providing resources and equipment.² From this initial planning stage, Virginia was named a best practices model by SAFECOM for interoperable communications planning and establishing practitioner-based governance.

Figure 1 below shows this initial planning for the development of the Strategic Plan for Statewide Communications Interoperability which included regional focus groups and a large strategic planning session.

¹ SAFECOM, a communications program of the Department of Homeland Security's Office for Interoperability and Compatibility, works with its Federal partners to provide research, development, testing and evaluation, guidance, tools, and templates on communications-related issues to local, tribal, state, and Federal public safety agencies.

² This project was supported through a MOU between the Commonwealth of Virginia and the U.S. Department of Homeland Security's SAFECOM program and an U.S. Department of Justice grant (2003-IJ-CX-K027) from the National Institute of Justice.

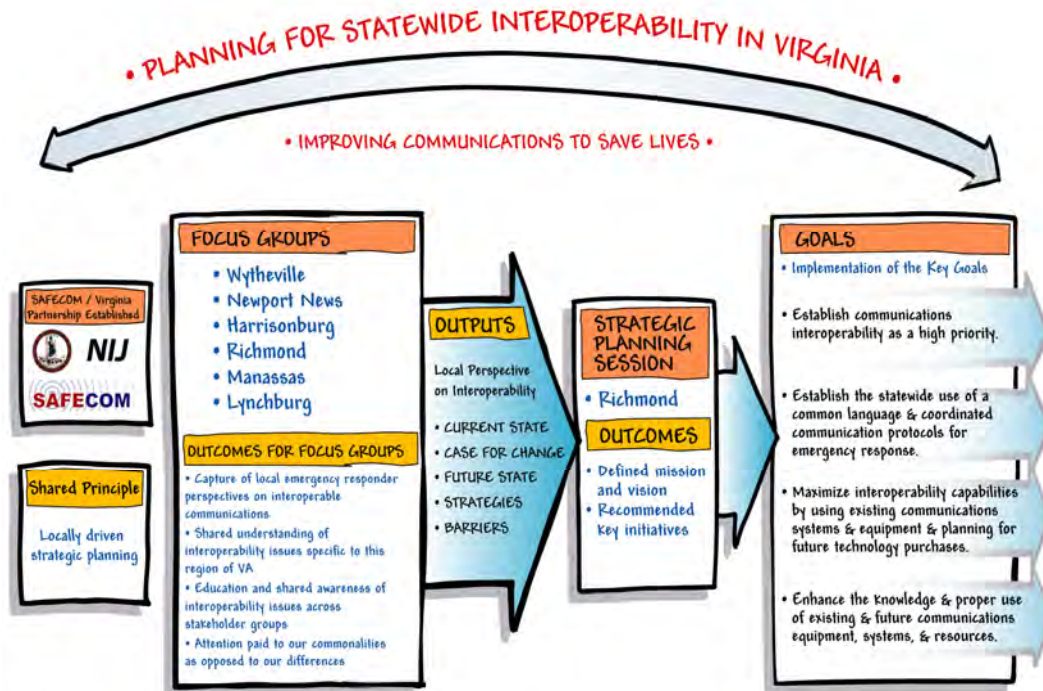


Figure 1: Initial Strategic Planning Process

Since 2004, two plans have been developed, updated, and implemented to increase the availability of interoperability information, establish governance, create standard operating procedures, and improve the technological capabilities of Virginia's practitioners. With the support of Governor Kaine, the FY 2007 Strategic Plan for Statewide Communications Interoperability marks the third installment of the plan. It focuses on new initiatives to maximize how equipment is used, improve how responders talk with one another, and address how the Commonwealth's responders prepare and practice for major emergencies.

Vision, Mission and Goals

This Statewide Plan supports the Commonwealth's interoperability vision and mission presented below:

2015 Vision

By 2015, agencies and their representatives at the local, regional, state, and federal levels will be able to communicate using compatible systems, in real time, across disciplines and jurisdictions, to respond more effectively during day-to-day operations and major emergency situations.

Mission

Improve public safety communications in the Commonwealth of Virginia through enhanced voice and data communications interoperability.

To achieve the 2015 vision, the State Interoperability Executive Committee (SIEC) developed the following long term goals to enhance data and voice communications interoperability:

GOAL 1: Create a common understanding of communications interoperability throughout the Commonwealth

GOAL 2: As appropriate, utilize common language, coordinated protocols and standards statewide

GOAL 3: Integrate existing and future communications systems

GOAL 4: Facilitate training to enhance effective use of communications systems

Virginia Interoperability Planning Lifecycle

Comment [MSOffice2]: Think about short term wins and where the cycle ends for recommendations and initiatives in the graphic.

The Commonwealth of Virginia uses an annual planning lifecycle to update, implement, institutionalize, and measure the success of the Statewide Plan. This lifecycle (depicted in Figure 2) consists of four stages: “Plan”, “Implement,” “Assess & Measure,” and “Buy-In & Compliance”. This planning lifecycle will be used each year until 2015 or until the Vision is achieved, whichever is sooner.

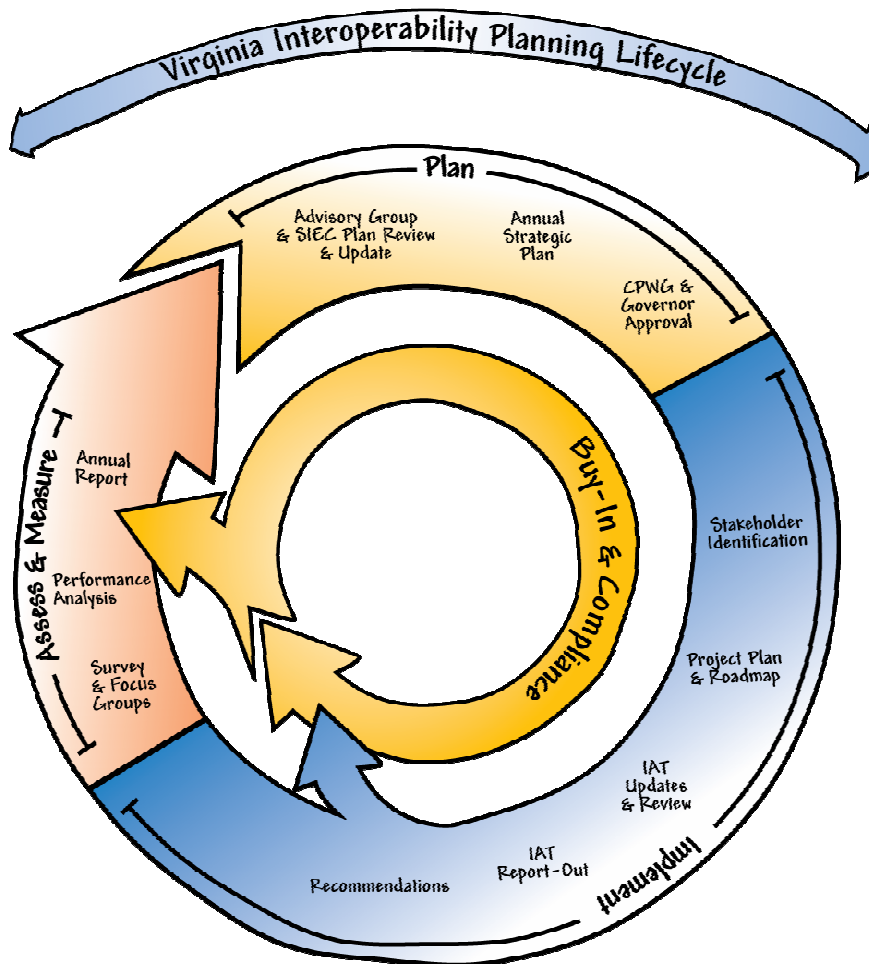


Figure 2: Virginia Interoperability Planning Lifecycle

Plan

During the planning stage the Statewide Plan is updated and enhanced by the members of the interoperability governance structure. Recommendations from the previous fiscal year and the current environment are considered to:

- Add new initiatives to be accomplished in the coming year

- Update and carry over incremental initiatives from the previous year that are still pertinent to the effort
- Remove initiatives that have been accomplished
- Add new content to the supplemental information sections of the Statewide Plan to provide practitioners with the most up to date information about the status of interoperability in the Commonwealth

The final draft of the Statewide Plan is sent to the Commonwealth Preparedness Working Group, Secure Commonwealth Panel, and the Governor for consideration and approval. Once the Governor has signed-off on the Statewide Plan another year of implementation begins.

Implement

As the longest stage of the Lifecycle, implementation engages practitioners to bring expertise and experience together to achieve the initiatives within the Statewide Plan. Key activities include:

- Identify stakeholders to assist in the achievement of initiatives - a thorough process is conducted to ensure needed expertise is present to make key decisions. Identified stakeholders form teams called, Initiative Action Teams (IATs) (IATs are discussed in more detail in the Governance Section of this Statewide Plan).
- Develop a roadmap and project plan for presenting recommendations and moving towards buy-in and compliance for each IAT
- Convene the governance groups to review the progress of initiatives and recommendations from IATs

As recommendations are born out of the implementation phase and accepted by members of the interoperability governance structure, they move towards institutionalization in the “Buy-In & Compliance” phase of the lifecycle. If recommendations are not approved or require additional work for acceptance, they will remain in the outer ring of the lifecycle to be measured and planned for in the following fiscal year. Complex initiatives may take multiple years to achieve buy-in and compliance while others may be institutionalized more quickly.

Assess & Measure

Performance is measured annually for both long-term outcome performance measures and short-term measures. This stage of the lifecycle requires the CICO to:

- Reach out to stakeholders to receive input on the year’s implementation
- Analyze performance against the measures
- Develop an annual report that shows progress, set backs, and areas for continued improvement in the year to come

Buy-In and Compliance

The process of achieving buy-in and compliance is continuous throughout the fiscal year. Once IAT recommendations are approved, and a course of action is determined, the effort begins the process of achieving buy-in from all necessary stakeholders on the local, regional and state level. While buy-in is achieved, compliance will be pursued at the local and regional level through information sharing and collaborative sessions, and at the state level through recognized best practices, Executive Orders and legislation (if appropriate).

Long Term Performance Measures

Two comprehensive and aggressive long term performance measures have been developed to show the progress of the Commonwealth's interoperability effort as it moves towards the 2015 Vision. The performance measures are used in tandem with the Interoperability Continuum along with the interoperability database and inventory that will be established in FY 2007 to assess the current state of interoperability in the Commonwealth.

Performance Measures

- 1) *The ability and effectiveness of local, regional, state, non-profit and private entities to communicate with voice and data*
- 2) *Coordination with state agencies' interoperable communication efforts*

Performance will be measured by:

- The annual update and maintenance of an interoperability database of local, regional, and statewide equipment, governance, along with standard operating procedures.
- An annual self-assessment based on the National Interoperability Continuum that will indicate rightward movement towards appropriate interoperability levels. The Interoperability Continuum is presented in Figure 3 below. For more information about the Continuum please visit the SAFECOM program website at www.safecomprogram.gov.
- The baseline for both measures will be established in FY 2007.

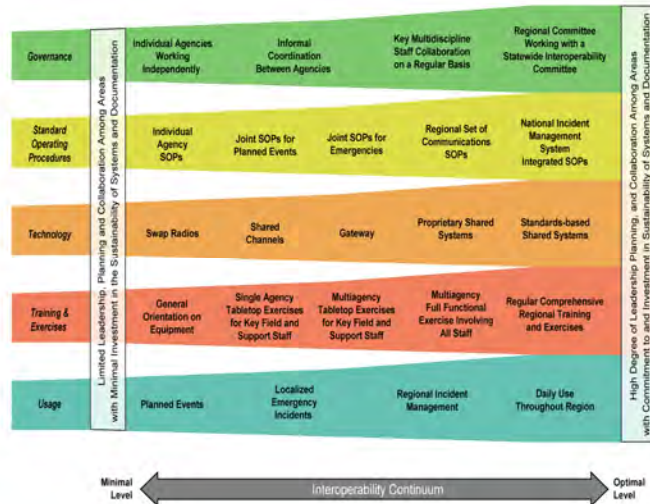


Figure 3: Interoperability Continuum

Interoperability Governance

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To support the interoperability effort, implement the Statewide Plan, and ensure that the needs of responders are met, Virginia established a practitioner-driven governance structure. The structure consists of a full time Commonwealth Interoperability Coordinator within the Commonwealth Interoperability Coordinator's Office (CICO), the State Interoperability Executive Committee (SIEC), and the State Interoperability Advisory Group (Advisory Group). In addition to these established governance bodies, Initiative Action Teams (IATs) are assembled to convene stakeholders and experts in specific fields to collaborate on interoperability issues, as needed.

The governance structure and flow of information are depicted in Figure 4 below.

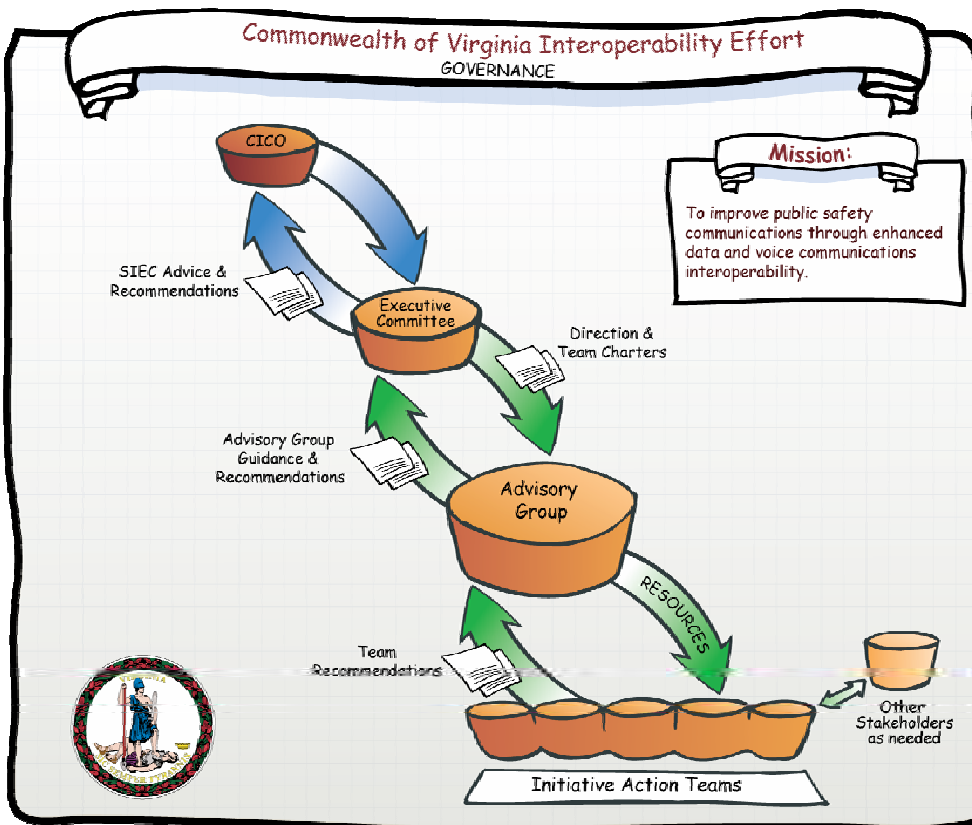


Figure 4: Virginia Interoperability Governance Structure

The following sections describe each portion of this governance structure.

I. Commonwealth Interoperability Coordinator's Office (CICO)

The CICO, led by the Commonwealth Interoperability Coordinator, was established to ensure the implementation of the Statewide Plan and coordinate major interoperability activities across the Commonwealth. The CICO is located within the Governor's Office of Commonwealth Preparedness and works across the various Secretariats and levels of government.

The CICO coordinates initiatives, communicates information, and facilitates discussion on interoperability efforts among state, regional, local, federal and private industry stakeholders. As the scope of the CICO expands over time, or as initiatives are accomplished, the responsibilities of the CICO may adjust to accommodate this growth.

Responsibilities

The CICO ensures that the Statewide Plan meets the communications interoperability needs of Virginia's public safety practitioners and aligns with direction from the Commonwealth and the federal government. Responsibilities include the following:

- Liaise among the local and regional public safety community, state agencies and officials, and the federal government
- Drive and coordinate the effort to implement the Statewide Plan
- Revise the Statewide Plan annually
- Ensure proper representation within the interoperability governance structure
- Develop and measure long-term and annual performance measures to show progress towards improved interoperability
- Coordinate the compilation of state investment justifications for communications interoperability
- Serve as the liaison between the SIEC and other groups
- Serve as a member of the Commonwealth Preparedness Working Group (CPWG)
- Serve as Virginia's representative to the National Capital Region Regional Programmatic Working Group for Interoperability (RPWG-I)
- Serve as a member of the Capital Wireless Information Net (CapWIN) Board of Directors
- Serve as a member of the SAFECOM Emergency Responder Committee
- Pursue funding support for interoperable communication projects

II. State Interoperability Executive Committee (SIEC)

The SIEC serves as the steering group for the effort and provides guidance and recommendations via the CICO for the CPWG, Secure Commonwealth Panel, and Governor's Office. At least quarterly, the SIEC reviews the overall progress of the effort and approves goals and priorities.

The SIEC consists of 14 representatives from local and state public safety associations and government including:

- Virginia Associations of Chiefs of Police
- Virginia Fire Chiefs Association
- Virginia Sheriffs' Association
- Virginia Association of Governmental EMS Administrators
- Virginia Association of Public Safety Communication Officials
- Virginia Association of Counties
- Virginia Municipal League
- Virginia Military Advisory Committee
- Statewide Agencies Radio System
- Virginia Information Technologies Agency
- Office of the Secretary of Public Safety
- Office of the Secretary of Technology
- Office of Commonwealth Preparedness
- Commonwealth Interoperability Coordinator's Office

Responsibilities

The members of the SIEC play a key role in the definition and implementation of the initiatives outlined in the Statewide Plan. The SIEC provides guidance and recommendations to the Advisory Group, IATs and the CICO, drawing upon their experience and knowledge of public safety needs and capabilities.

SIEC members:

- Recommend an approach for Virginia's interoperability efforts
- Develop formal recommendations to the CICO for the CPWG and Secure Commonwealth Panel
- Report information back to their respective organizations
- Provide advice, feedback, and support to the CICO
- Resolve issues requiring policy, procedural, or other business decisions as needed
- Develop recommendations to the Governor for distribution of funds to localities for communications interoperability as required
- Advocate for interoperable communications at more senior levels of government and among member constituencies
- Consider guidance and approve recommendations from the Advisory Group and IATs

III. State Interoperability Advisory Group (Advisory Group)

The Advisory Group provides guidance and recommendations to the SIEC. The Advisory Group is comprised of representatives from local, regional and state public safety and government practitioner communities. The Advisory Group

meets at least quarterly and assists the CICO and SIEC in the implementation of the Statewide Plan.

The Advisory Group consists of the 14 SIEC members and representation from the following organizations:

- Virginia Hospital and Healthcare Association
- Virginia National Emergency Number Association
- Virginia Professional Firefighters Association
- Virginia State Firefighters Association
- Virginia Emergency Management Association
- At Large EMS Virginia Association of Volunteer Rescue Squads
- Virginia Campus Law Enforcement Association
- Wireless E-911 Services Board
- Radio Amateur Civil Emergency Services
- Virginia Local Government Information Technology Executives
- Northern Virginia Chief Information Officers
- Northern Virginia Emergency Managers Committee
- Hampton Roads Planning District Commission
- Central Virginia Communications Board
- Capitol Region Communications Steering Committee
- Metropolitan Washington Airport Authority
- State Interdepartmental Radio System Board
- Virginia National Guard
- Virginia Department of Emergency Management
- Virginia Department of Fire Programs
- Virginia Department of Forestry
- Virginia Department of Health
- Virginia Department of Transportation
- Virginia Port Authority
- Virginia State Police
- Virginia Department of Health's Emergency Medical Services
- Virginia Department of Rail and Public Transportation
- Virginia Department of Criminal Justice Services
- Virginia Department of Game and Inland Fisheries
- Federal Partnership for Interoperable Communications

The membership of the Advisory Group is evaluated on a regular basis to ensure representatives possess the knowledge, experience, and expertise to aid in the implementation of the Statewide Plan.

Responsibilities

The Advisory Group provides guidance to the SIEC that incorporates the knowledge and expertise of all members. During regular meetings, the Advisory Group reviews overall progress and discusses priorities and initiatives.

Advisory Group members:

- Provide general guidance and recommendations to the SIEC and CICO
- Provide advice, feedback and support to the SIEC
- Participate in IATs to develop work products and implement initiatives from the Statewide Plan
- Communicate decisions, plans, and results to relevant constituencies

IV. Initiative Action Teams (IATs)

IATs are established on an as-needed basis to assist in the implementation of the initiatives in the Statewide Plan. The IATs operate under a limited time charter and are given a general timeline in which they will undertake specific tasks to improve public safety interoperable communications across the Commonwealth by the SIEC.

The IATs are directed primarily by the CICO working in conjunction with the SIEC and Advisory Group. Local public safety practitioners and others necessary to accomplish the project tasks are recruited as needed to ensure maximum stakeholder involvement.

The IAT presents results and recommendations to the SIEC for consideration. Once approved, the SIEC will provide the recommendations to the CICO for acceptance.

Responsibilities

IAT members:

- Assign an IAT Lead to coordinate activities, arrange meetings, and report back to the SIEC and CICO
- In coordination with the CICO, pursue needed resources to successfully complete assigned tasks
- Establish a project timeline with interim milestones, resources, and task owners
- Prepare monthly progress reports for the CICO

FY 2007 Initiatives and Tasks

Overview

To update the Statewide Plan and incorporate new FY 2007 initiatives, the Advisory Group met for a one day session to review the results of the FY 2006 Statewide Plan and provide recommendations to the SIEC for a new set of initiatives and tasks. These recommendations were provided to the SIEC for consideration. The SIEC reviewed and refined the recommendations into this final set of initiatives and tasks for FY 2007.

Each initiative is a stepping stone towards the achievement of one or more of the strategic goals (shown in Figure 6) and is grouped into the following overarching categories.

Outreach

Outreach initiatives work to bring interoperability information to Virginia's practitioners, elected officials, and other stakeholders as well as private and non-profit partners. These initiatives focus on the development of standardized materials, the update and maintenance of the Interoperability in Virginia website, grant writing assistance, and disseminating technical information directly to locals.

Governance

Governance initiatives enhance, foster, and maintain the interoperability effort in the Commonwealth of Virginia by involving an ever-increasing number of practitioners in the planning process.

Technology

Technology initiatives at the state level coordinate major statewide investments and assets, increase the ability of practitioners to respond to major emergencies, and identify technological gaps on a regional and state basis.

Operational Protocol

Operational protocol initiatives help overcome operational and cultural barriers to improve practitioner-to-practitioner communications for day to day as well as major emergency situations.

Training

Training initiatives provide and exercise a standardized definition of interoperability and help localities obtain additional grant funds through improved grant writing.

Outreach Initiatives

Initiative 1

Develop, distribute and promote interoperable communications information to stakeholders

Tasks

- Communicate information about grant writing training and assistance
 - Encourage attendance at the Association of Public Safety Communication Officials (APCO) and National Emergency Number Association (NENA) grant writing course
 - Identify non profit partners to assist in grant writing
 - Promote the Interoperability Communications Technical Assistance Program (ICTAP)
 - Work with Virginia Universities to leverage grant writing resources they can provide to localities
- Update and maintain the Interoperability in Virginia website including a lessons learned clearinghouse. Subtasks may include but are not limited to:
 - Promote a resource library of local, state, and federal information
 - Publicize the 7 regions recognized by the Governor for all homeland security efforts and elevate concerns about regional construct to the Commonwealth Preparedness Working Group (CPWG)
 - Provide Federal Communications Commission (FCC) Narrowbanding guidance and requirements
 - Provide Project 25 (P25) website information
- Plan and conduct the annual Virginia Interoperability Communications Conference
- Attend, make presentations, and provide materials to key stakeholders and national conferences
- Communicate the importance and continued existence of State Interdepartmental Radio System (SIRS)

In general, the CICO will continue to pursue a three-pronged strategy for outreach throughout the Commonwealth as demonstrated in Figure 5.

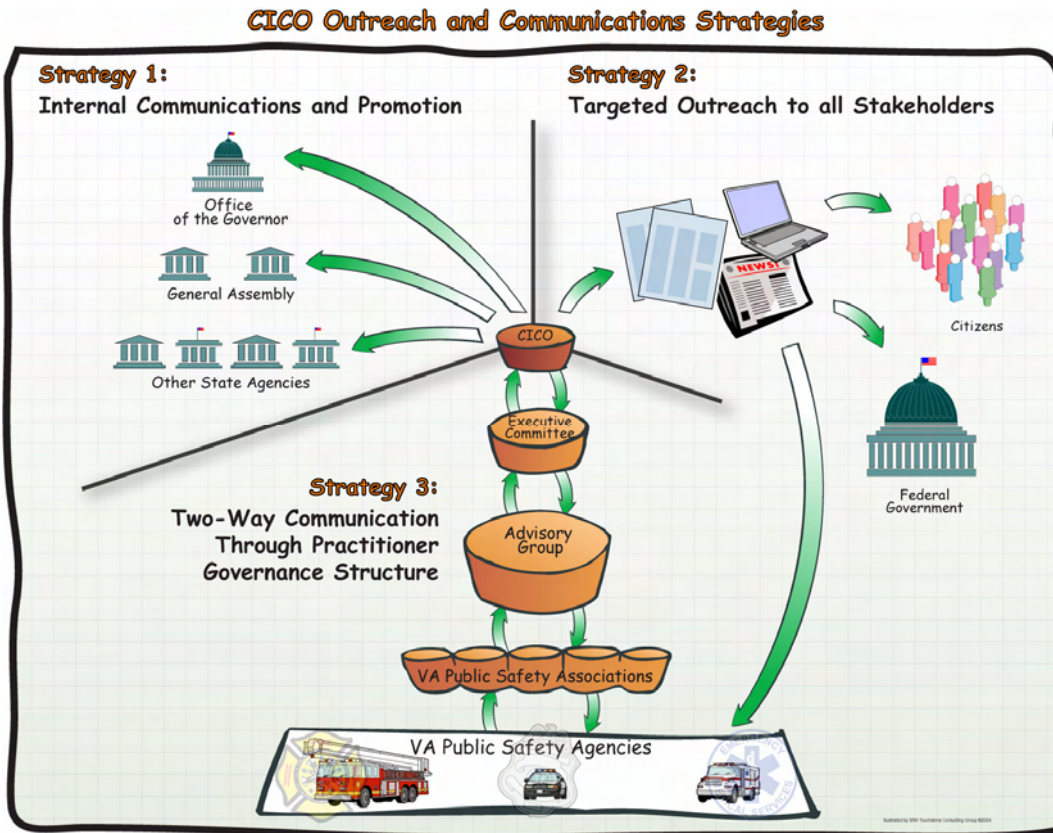


Figure 5: CICO Outreach and Communications Strategies

Initiative 2

Hire an outreach and technical consultant within the Commonwealth Interoperability Coordinator's Office (CICO) to provide stakeholders with information and assistance regarding interoperability solutions

Tasks

- The contracted tasks will include:
 - Determine and promote how the Commonwealth Link to Interoperable Communications (COMLINC) can assist localities and regions in attaining interoperability
 - Work with localities to develop Requests for Proposals (RFPs) allowing for connectivity via COMLINC
 - Review other interoperable communications solutions and prepare technical evaluations for each potential solution

Governance Initiatives

Initiative 3

Sustain the interoperability effort

Tasks

- Develop a long-term strategy to maintain the Commonwealth's Interoperability effort including the CICO and Project Management Office
- Work to transition the CICO from grant funds to general fund support
- Obtain a Governor's Executive Order formally establishing the SIEC
- Provide an annual interoperable communications update to the Governor, General Assembly, and Virginia's Congressional Delegation

Initiative 4

Support existing and establish new regional governance interoperability coordinating organizations

Tasks

- Ensure appropriate representation on the Advisory Group by all regions
- Provide additional collaborative forums to discuss regional issues
 - Plan and conduct regional forums at the annual Virginia Interoperability Communications Conference
- Leverage Virginia Department of Emergency Management (VDEM) regional coordination

Technology Initiatives

Initiative 5

Establish a database of interoperability communication equipment, local and regional governance groups, and standard operating procedures (SOPS)

Tasks

- Develop an RFP to hire a technical and operational assessment consultant to:
 - Establish criteria for information to be collected
 - Conduct the inventory
 - Leverage the Communications Assets Survey & Modeling (CASM) tool as appropriate for equipment inventory
 - Share information collected with Virginia Department of Emergency Management (VDEM) to ensure Virginia's Emergency Operations Center (EOC) is informed of existing resources and points of contact
- Continue to gather mutual aid channel information statewide
 - Add to the Computer Assisted Pre-Coordination Resource and Database System (CAPRAD)

Initiative 6

Increase coordination and collaboration between the Commonwealth Interoperability Coordinator's Office (CICO) and the Virginia National Guard to leverage its unique federal/state capabilities

Tasks

- Identify tactical communications assets that the Virginia National Guard can leverage until the Statewide Agencies Radio System (STARS) project is completely built out
- Identify Virginia National Guard assets that can be leveraged by the Commonwealth
- Utilize the Virginia National Guard to facilitate interoperability with U.S. Department of Defense capabilities

Initiative 7

Research opportunities and facilitate policy development for strategic radio caches

Tasks

- Identify regions with adequate equipment and resources that can support a radio cache
- Focus on the standardization of equipment breakdown, deployment strategy, protocols, and training

Initiative 8

Continue to support and facilitate the 800 MHz rebanding effort within the Commonwealth

Tasks

- Fund a consultant for regional planning and information gathering efforts as funding permits
- Request periodic updates from VITA on progress to the SIEC
- Engage SIEC and Advisory Group member organizations, and SAFECOM in the rebanding effort as necessary to promote and endorse what is best for public safety

Initiative 9

Utilize the State Interoperability Executive Committee (SIEC) to provide input to ensure the Virginia Information Technologies Agency (VITA) Information Technology (IT) Infrastructure Project meets the needs of public safety practitioners

Tasks

- Foster relationship among CICO, SIEC & VITA IT Project Manager
- Determine how VITA's IT Infrastructure Project can assist statewide interoperability
- Leverage any potential cost effectiveness of this infrastructure and work with VITA to maximize economies of scale for localities
- Champion public safety priority on this infrastructure

Operational Protocol Initiatives

Initiative 10

Identify and promote the use of nationally recognized Federal Communications Commission (FCC) designated interoperability channels in the VHF, UHF, 700 MHz and 800 MHz bands that can be used in the Commonwealth

Tasks

- Clarify the difference between mutual aid and interoperability channels
- Research standard common nomenclature at the federal level
 - Promote or develop a common nomenclature guidance
- Promote National Public Safety Planning Advisory Committee (NPSPAC), VTAC, and UTAC interoperability channels
- Require interoperability channels in all new radios purchased with grant funding
- Develop or leverage an existing training “How to Guide” for using the national interoperability channels
- Complete statewide inventory of channels currently in use
- Conduct a feasibility study for deploying interoperability channels statewide on STARS transmitter sites
- During the 800 MHz Rebanding process, recommend that all 800 MHz portable and mobile radios add NPSPAC when possible

Initiative 11

Encourage adoption of the common language best practice on the local, state and federal level

Tasks

- Promote formal endorsement of the best practice on the state and local level
- Disseminate, train on, and evaluate the common language best practice at the state and local level to encourage and promote adoption of and practice on common language
 - Establish a pilot project that involves VSP and localities within a VSP division to test the common language best practice
- Achieve buy-in and coordinate with training academies
- Work with SAFECOM towards a national common language best practice leveraging the work of Virginia
- Pursue an Executive Order

Initiative 12

In support of National Incident Management System (NIMS) implementation across the Commonwealth, endorse the Communications Unit Leader (COML) concept and encourage NIMS certification

Tasks

- Monitor COML curriculum development and work with VDEM and Virginia Department of Fire Programs (VDFP) to prepare course delivery
- Publicize the need for NIMS compliance according to federal deadlines on the Interoperability in Virginia website
- Encourage completion of IS 700 NIMS training for all SIEC and Advisory Group members

Training Initiatives

Initiative 13

Work with state agencies to ensure that interoperability information is a part of grant training

Tasks

- Recommend standard interoperability requirements for incorporation into agency conducted grant training
 - Work with VDEM, Department of Criminal Justice Services (DCJS), Virginia Department of Health (VDH), VDFP, and other state agencies to ensure that interoperable communications is a part of grant training

Initiative 14

Identify and develop interoperability training exercise opportunities

Tasks

- Coordinate with VDEM and Virginia Department of Health to develop and conduct live communications interoperability exercises
- Identify opportunities for new training

Initiatives Mapped to Plan Goals

	Initiatives	GOAL 1: Create a common understanding of communications interoperability throughout the Commonwealth	GOAL 2: As appropriate, utilize common language, coordinated protocols and standards statewide	GOAL 3: Integrate existing and future communications systems	GOAL 4: Facilitate training to enhance effective use of communications systems
Outreach Initiatives	1) Develop, distribute and promote interoperable communications information to stakeholders	X			X
	2) Hire an outreach and technical consultant within the Commonwealth Interoperability Coordinator's Office (CICDO) to provide stakeholders with information and assistance regarding interoperability solutions	X	X	X	
Governance Initiatives	3) Sustain the interoperability effort	X	X	X	X
	4) Support existing and establish new regional governance interoperability coordinating organizations	X			
Technology Initiatives	5) Establish a database of interoperability communication equipment, local and regional governance groups, and standard operating procedures (SOPs)	X	X	X	
	6) Increase coordination and collaboration between the Commonwealth Interoperability Coordinator's Office (CICDO) and the Virginia National Guard to leverage its unique federal/state capabilities	X		X	
	7) Coordinate statewide planning, implementation and policy for strategic radio caches		X	X	
	8) Continue to support and facilitate the 800 MHz rebanding effort within the Commonwealth	X	X		
	9) Utilize the State Interoperability Executive Committee (SIEC) to provide input to ensure the Virginia Information Technologies Agency (VITA) Information Technology (IT) Infrastructure Project meets the needs of public safety practitioners	X		X	
Operational Protocol Initiatives	10) Identify and promote the use of nationally recognized Federal Communications Commission (FCC) designated interoperability channels in the VHF, UHF, and 800 MHz bands that can be used in the Commonwealth		X	X	
	11) Encourage adoption of the common language best practice on the local, state and federal level		X		X
	12) In support of National Incident Management System (NIMS) implementation across the Commonwealth, endorse the Communications Unit Leader (CUL) concept and encourage NIMS certification	X	X		X
Training Initiatives	13) Work with state agencies to ensure that interoperability information is a part of grant training	X			X
	14) Develop an interoperability training and testing program	X	X		X

Figure 6: Initiatives Mapped to Plan Goals

Project Implementation Timeline

The initiatives presented above mark the end of the “Plan” phase of the planning lifecycle and the beginning of implementation and measurement of the Fiscal Year 2007 Statewide Plan as shown in Figure 6 below.

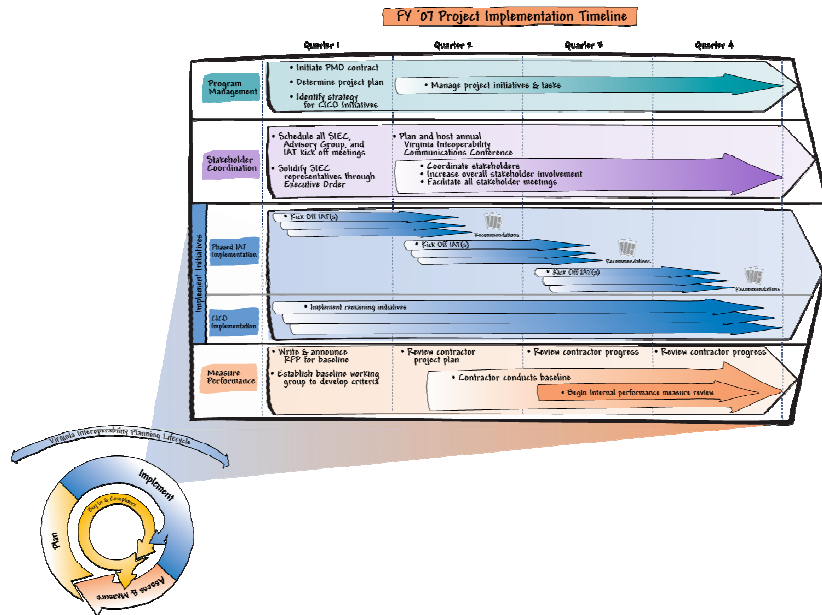


Figure 7: Project Timeline in Relation to the Interoperability Planning Lifecycle

The project timeline, shown in Figure 7 below, shows more detailed activities for the first 90 days of the project and an estimated roadmap for the remainder of the fiscal year. Initial activities will set-up the project for program management, stakeholder involvement, and performance measurement. In addition, the SIEC will prioritize initiatives, determine if an IAT is necessary for each initiative, and begin implementation. For those initiatives that require an IAT, a phased approach will be used for implementation –results and recommendations will be rolled out on a quarterly basis.

FY '07 Project Implementation Timeline

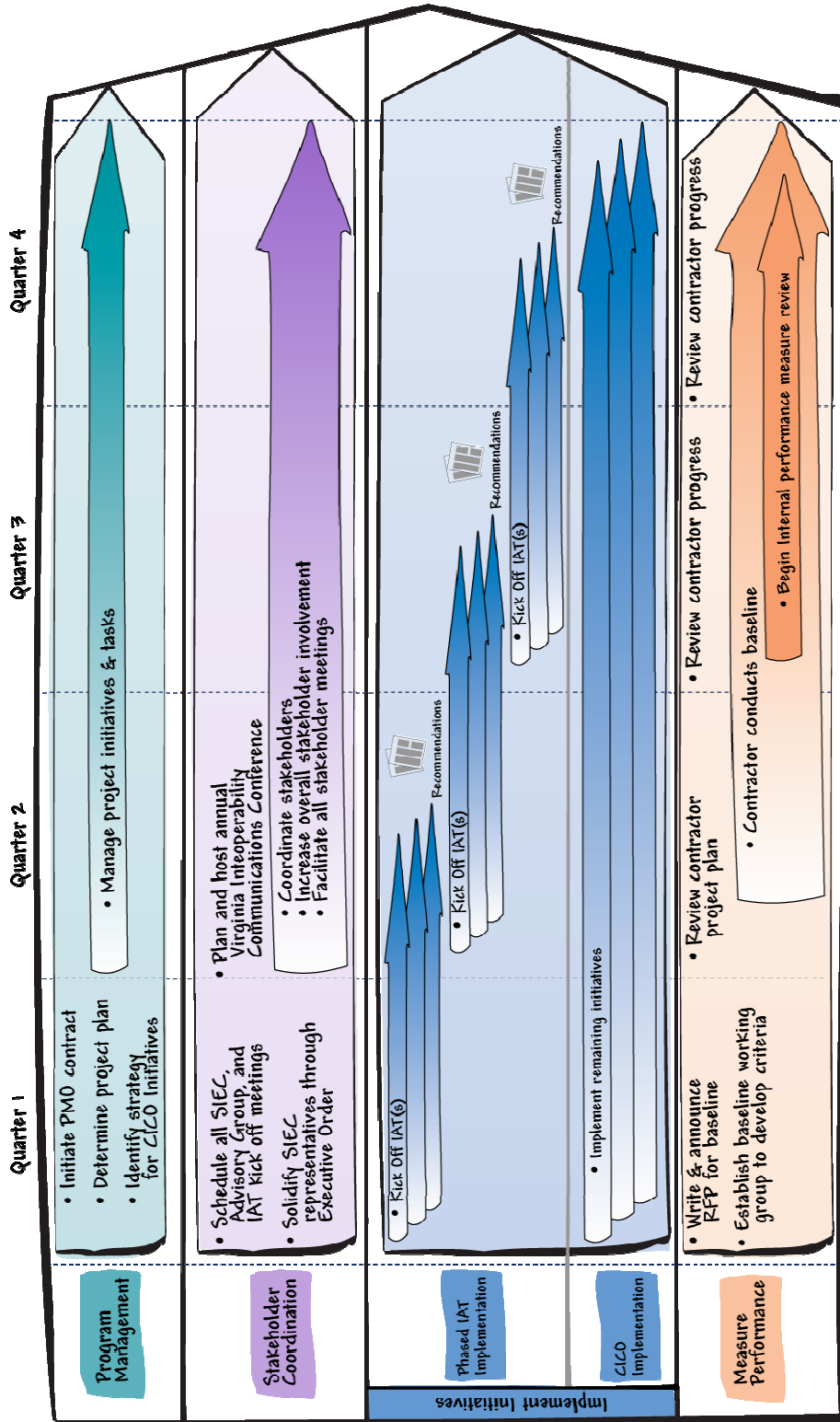


Figure 8: Project Implementation Timeline

Short Term Measures

To track the fiscal year's accomplishments, the following short term measures were developed. These measures link directly to one or more of the FY 2007 Initiatives and Tasks and align with the long term outcome performance measures to support the effort's mission, vision, and goals.

- Hits on the Interoperability in Virginia website increase by 5% each month of FY 2007
- At least one regional representative is on the Advisory Group from each of Virginia's homeland security regions
- Inventory of state voice and data communication resources is conducted
- At least 80% of the SIEC and Advisory Group organization formally endorse the Common Language Best Practice
- Participate in at least one regional live interoperability exercise

Consistency With and Support of the Plan

Overview (Virginia Code 9.1-1200)

In March 2005, the Virginia Code was modified to require the annual update and implementation of the Strategic Plan for Statewide Communications Interoperability. In addition to this directive, the code directs state agencies and localities to align with the Statewide Plan in order to receive state and federal funds for communications interoperability.

This section of the Statewide Plan provides an overview of the Virginia Code and the specific guidelines that will determine eligibility for state and federal grants. The eligibility guidelines will expand as additional standards and protocols are disseminated by the state and federal government. The Virginia Code states the following:

CHAPTER 221

An Act to amend the Code of Virginia by adding in Title 9.1 a chapter numbered 11, consisting of a section numbered [9.1-1200](#), relating to statewide communications interoperability.

[S 963]

Approved March 20, 2005

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding in Title 9.1 a chapter numbered 11, consisting of a section numbered [9.1-1200](#), as follows:

CHAPTER 11. STATEWIDE COMMUNICATIONS INTEROPERABILITY.

§ [9.1-1200](#). *Review of strategic plan; state and local compliance.*

The office of the Governor shall ensure that the annual review and update of the statewide interoperability strategic plan is accomplished and implemented to achieve effective and efficient communication between state, local, and federal communication systems.

All state agencies and localities shall achieve consistency with and support the goals of the statewide interoperability strategic plan by July 1, 2015, in order to remain eligible to receive state or federal funds for communications programs and systems.

Virginia Homeland Security Planning Regions

The Governor recognized the Virginia State Police Districts as the construct for homeland security regional planning purposes including communications interoperability. By focusing on regional planning, the Commonwealth is compliant with federal regulations for grant submissions and can more effectively address the needs of practitioners. It is acknowledged that communications interoperability must cross regional and even state borders in order to be effective. When planning for interoperability investments, localities must consider a regional approach based on Figure 9: Homeland Security Planning Regions as seen below.

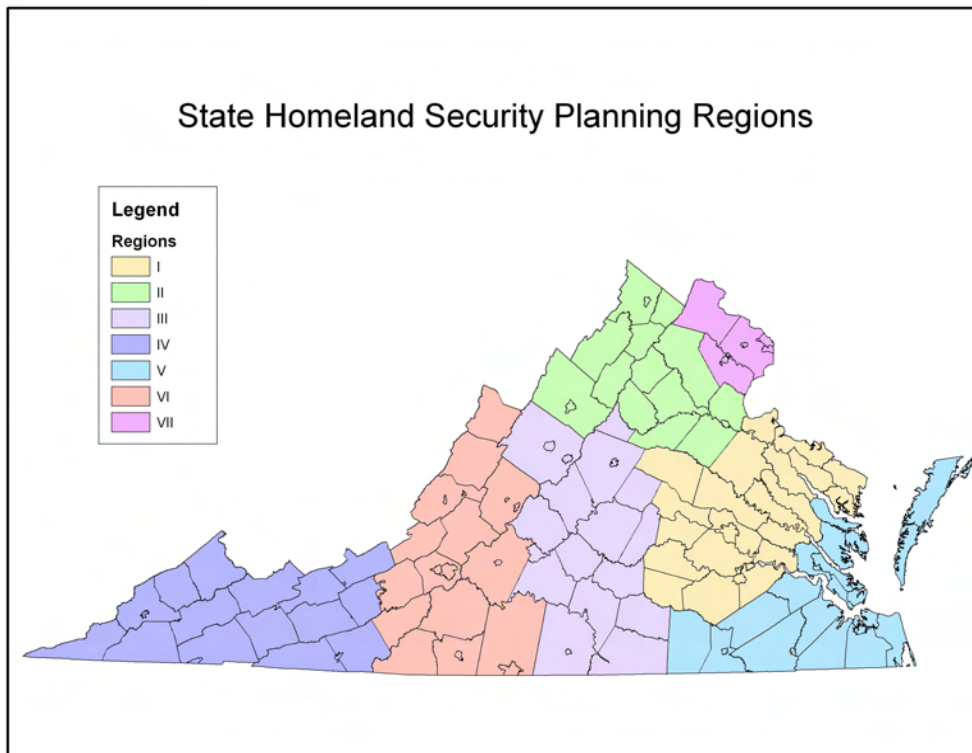


Figure 9: Virginia Homeland Security Planning Regions

The counties and cities contained within each region are presented on the following page.

Region 1: Richmond

- Amelia County
- Caroline County
- Charles City County
- Chesterfield County
- City of Colonial Heights
- Dinwiddie County
- Essex County
- Goochland County
- Hanover County
- Henrico County
- City of Hopewell
- King & Queen County
- King George County
- King William County
- King William County
- Lancaster County
- Louisa County
- New Kent County
- Northumberland County
- Nottoway County
- City of Petersburg
- Powhatan County
- Prince George County
- Richmond County
- City of Richmond
- Westmoreland County

Region 2: Culpeper

- Clark County
- Culpeper County
- Fauquier County
- Frederick County
- City of Fredericksburg
- City of Harrisonburg
- Madison County
- Orange County
- Page County
- Rappahannock County
- Rockingham County
- Shenandoah County
- Spotsylvania County
- Stafford County
- Warren County
- City of Winchester

Region 3: Central Virginia

- Albemarle County
- Amherst County
- Appomattox County
- Augusta County
- Buckingham County
- Campbell County
- Charlotte County
- City of Charlottesville
- Cumberland County
- Fluvanna County
- Greene County
- Halifax County
- Lunenburg County
- City of Lynchburg
- Mecklenburg County
- Nelson County
- Prince Edward County
- City of Staunton
- City of South Boston
- City of Waynesboro

Region 4: Southwest

- Bland County
- Buchanan County
- Carroll County
- City of Bristol
- Dickenson County
- City of Galax
- Giles County
- Grayson County
- Lee County
- City of Norton
- Pulaski County
- Russell County
- Scott County
- Smith County
- Tazewell County
- Washington County
- Wise County
- Wythe County

Region 5: Tidewater

- Accomack County
- Brunswick County
- City of Chesapeake
- City of Emporia
- City of Franklin
- Gloucester County
- Greensville County
- City of Hampton
- Isle of Wight County
- James City County
- Matthews County
- Middlesex County
- Northampton County
- City of Newport News
- City of Norfolk
- City of Poquoson
- City of Portsmouth
- Southampton County
- City of Suffolk
- Surry County
- Sussex County
- City of Virginia Beach
- City of Williamsburg
- York County

Region 6: Roanoke

- Alleghany County
- Bath County
- Bedford County
- City of Bedford
- Botetourt County
- City of Bristol
- City of Buena Vista
- City of Covington
- Craig County
- City of Danville
- Floyd County
- Franklin County
- Henry County
- Highland County
- City of Lexington
- City of Martinsville
- Montgomery County
- Patrick County
- Pittsylvania County
- City of Radford
- Roanoke County
- City of Roanoke
- Rockbridge County
- City of Salem

Region 7: Northern Virginia

- Arlington County
- City of Alexandria
- City of Fairfax
- City of Falls Church
- Fairfax County
- Loudoun County
- City of Manassas
- City of Manassas Park
- Prince William County

Eligibility for State and Federal Grant Funds

In order to be eligible for state and federal grant funding for improving public safety communications and interoperability in FY 2007 in the Commonwealth of Virginia, applicants must comply with the following:

1. Grant requests must support at least one of the **four goals or initiatives** presented within this Statewide Plan.
2. Applicants must be able to clearly define how the project or equipment purchase improves interoperable communications on a **multi-discipline and multi-jurisdictional basis**.
3. Applicants must be National Incident Management System (NIMS) certified and compliant. For more information please visit <http://www.fema.gov/nims>.
4. Agencies and organizations must endorse Virginia's **Common Language Best Practice** for day-to-day and major emergency situations. For information regarding the endorsement of the best practice please contact the Commonwealth Interoperability Coordinator's Office at (804) 225-3800.
5. Equipment purchased with federal grants funds must be on the Department of Homeland Security's Grants and Training (G&T) **Authorized Equipment List (AEL)** or an exception letter must be on file and approved. For more information on the AEL please visit the Responder Knowledge Base at http://www.ojp.usdoj.gov/odp/equipment_rkb.htm.
6. Subscriber radios purchased must be programmed with **mutual aid and interoperability channels**.
7. Proof of FCC licenses required when appropriate.
8. Data sharing equipment purchased with federal grants funds must comply with the Department of Homeland Security's and Emergency Interoperability Consortium's **Emergency Data Exchange Language (EDXL)**.
9. When procuring equipment for communication system development and expansion, a standards based approach should be used to begin migration to multi-jurisdictional and multi-disciplinary interoperability. Specifically, all new voice systems should be compatible with the ANSI/TIA/EIAA-102 Phase 1 (Project 25 or P25) suite of standards. Funding requests by agencies to replace or add radio equipment to an existing non-P25 system will be considered if there is an explanation as to how their radio selection will allow for improving interoperability or eventual migration to interoperable systems. This guidance does not preclude funding of non-P25 equipment when there are compelling reasons for using other solutions. Absent these compelling reasons, the Commonwealth intends that P25 equipment will be preferred for digital systems to which the standard applies.

Comment [MSOffice4]: Nothing found on-line for EDXL title change.

Comment [MSOffice5]: From FY 06 SAFECOM grant guidance

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10. Applications for federal funds allocated for improving public safety communications and interoperability shall be **public safety agencies or organizations at the local, tribal, regional, or state level** unless otherwise specified.
11. Applicants must be **compliant with all other federal grant guidance** as provided and appropriate.

Jurisdictions that Received Interoperability Grant Funding 2003-2006



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Regional Projects

Hampton Roads Region

The Hampton Roads region of southeastern Virginia has a population of about 1.6 million and is the fourth largest metropolitan area in the southeastern United States. It consists of 16 separate cities and counties with a combined land mass of almost 3,000 square miles. Hampton Roads is home to the third largest port in the country and more than a dozen military installations (including the NATO Allied Command Transformation). Considering these factors and the potentially devastating effect that a large-scale natural or man-made disaster could have on the region, communications and emergency preparedness are of critical importance. A key component of that preparedness is a communications system network that provides interoperability among local, regional, state, federal and Department of Defense public safety first responders.

The Hampton Roads Planning District Commission (HRPDC) consists of representatives from each of the 16 cities and counties that make up Hampton Roads and exists to help solve local and regional transportation and planning issues. The HRPDC is currently assisting in solving the problem of regional interoperability by utilizing funds from a port security grant to implement a microwave network that can provide voice and data transport throughout the Hampton Roads region.

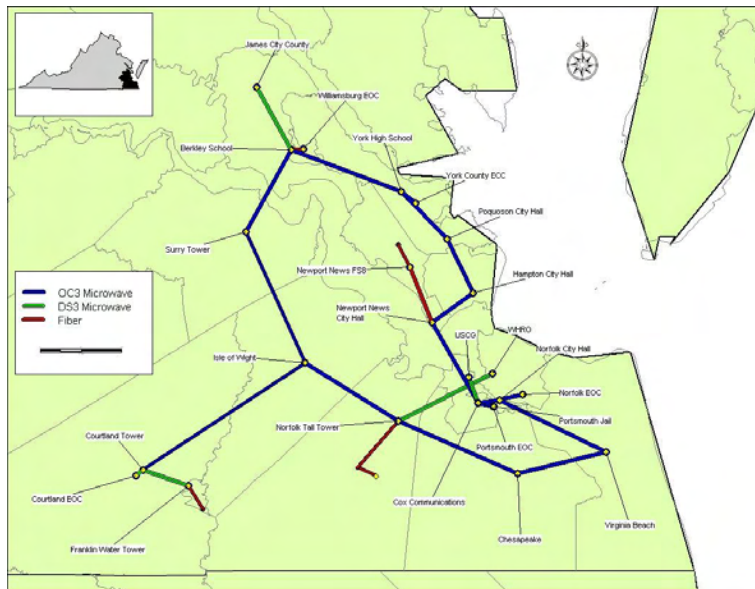


Figure 11: The HRPDC Microwave System

In addition to the microwave system, Virginia Beach was awarded a Homeland Security grant and is working with members of the Hampton Roads Trunked

User's Group (HRTUG) in the implementation of a nationally recognized regional 700 MHz Project 25 (P25) voice system and high speed mobile data system. The related effort called ORION (Overlay Regional Interoperability Network) will provide a wide area mobile data and P25 radio system in support of the region's public safety first responders.

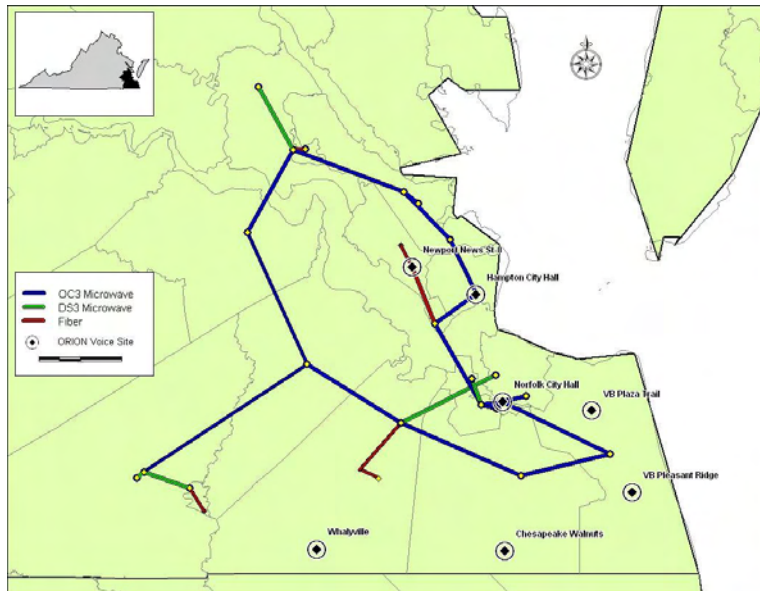


Figure 12: ORION 700MHz P25 Voice System

Hampton Roads will be one of the first regions in the country to test multiple new technologies to support regional interoperability. The anticipated success of these projects will provide valuable lessons learned in the areas of cooperative procurement, regional operations and technical aspects that can be utilized by agencies nationwide. Once the operational and technical solutions have been successfully implemented, Hampton Roads will build on the foundational charters to grow the interoperability solutions further throughout the region.

Collaboration with the Commonwealth's Interoperability Effort

To encourage collaboration between the statewide effort and the HRPDC, a representative from the region sits on the State Interoperability Advisory Group and participates heavily in Initiative Action Teams to share regional lessons learned and best practices.

For more information regarding the HRPDC, please contact Harry Yeomans, Manager, Hampton Roads Planning District Commission, at harry.yeomans@norfolk.gov.

National Capital Region

The National Capital Region (NCR) was created pursuant to the National Capital Planning Act of 1952 (Title 40, U.S.C., Sec. 71). The Act defined the NCR as the District of Columbia; Montgomery and Prince George's Counties of Maryland; Arlington, Fairfax, Loudoun, and Prince William Counties of Virginia; and all cities now or here after existing in Maryland or Virginia within the geographic area bounded by the outer boundaries of the combined area of said counties.

The centers of all three branches of the U.S. federal government are in Washington, D.C., as well as the headquarters of most federal agencies. The NCR also serves as the headquarters for the World Bank, the International Monetary Fund, and the Organization of American States, among other international (and national) institutions.

The NCR is served by three major airports, two of them located in suburban Virginia and one located in Maryland. The Capital Beltway creates an artificial boundary for the inner suburbs of Washington and is the root of the phrase "inside the Beltway." The NCR is also bisected by the Potomac River. Major interstates include: I-66, I-295, and I-395. The Washington area is also serviced by the Washington Metropolitan Area Transportation Authority (WMATA) public transportation system, which operates public buses (Metrobus) and the region's subway system (Metrorail). Many of the jurisdictions around the region also run public buses that interconnect with the Metrobus/Metrorail system. Additionally, Union Station is a critical transportation hub that interconnects Metrorail, MARC and Virginia Rail Express (VRE) commuter trains, and Amtrak intercity rail.

For federal planning purposes, the NCR region is defined as the jurisdictions represented on the map at right. These include:

- The City of Alexandria
- Arlington County
- The District of Columbia
- Fairfax County
- Loudoun County
- Montgomery County
- Prince George's County
- Prince William County

All inclusive municipalities are considered part of the region.



Figure13: NCR Regions

The NCR's regional public safety partners include the State of Maryland (SIEC), the Commonwealth of Virginia (SIEC), Washington Metropolitan Area Transit Authority, Metro Washington Airports Authority, more than 30 Federal law enforcement agencies operating in the region, and many more. With more than 35,000 radios in the region, and with many independent governments, and numerous individual public safety radio systems, in a small area; the NCR is one of the most complex interoperability environments in the country.

Currently, all local first responders in the NCR can communicate either by direct or patched communications. It is anticipated that by 2012 patched communications will no longer be required for local NCR first responders as all will communicate by direct communications. Communications with state and federal first responders will still require patching or issuance of "cache" 800 MHz radios.

Accomplishments in voice interoperability to date include:

- 800 MHz interoperability exists throughout the region
- District of Columbia tri-band radio network enables interoperability with WMATA and regional Federal agencies using both UHF and VHF systems
- Interoperability gateways are deployed throughout the region to connect disparate radio systems for use during regional events and missions
- NCR Radio Cache - 1,250 radio cache in the 800 MHz band was established to improve preparedness of the region
- PMARS and FMARS – police and fire mutual aid radio systems exist to provide greater connectivity between the region's dispatch centers.
- Upgrades and implementation of radio systems within subway tunnel system
- Regional Incident Communications and Coordination System (RICCSsm) established for incident based communications
- Washington Area Warning Alert System (WAWAS) established to convey warnings and situational awareness on a 24-hour basis
- Communication Asset & Survey Mapping Tool (CASM) – database and mapping tool containing all interoperable voice communication assets in the region.

The NCR is one of the most advanced data interoperability regions in the country. Accomplishments to date in data interoperability include:

- 12 site wireless broadband network in the District of Columbia to provide interoperable multi-media (video, messaging, data exchange, imaging, etc.) capabilities
- Capital Wireless Information Net (CapWIN) provides data interoperability and a national model for governance by establishing desktop and mobile text messaging and access to multiple law enforcement databases throughout the NCR

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- RICCS provides additional data communications via pager, cell phone and web for efficient information dissemination for emergency events

In the future the NCR will focus on the following:

Voice

- Fixed and Mobile **Gateway** system enhancements
- A **700 MHz P25 network** in Prince George's County by 2008/9 to advance seamless interoperability with regional 800 MHz users
- **STARS** implementation in the Commonwealth of Virginia to include 700 MHz portable radios to be used on the NCR 800 MHz radio networks by 2009
- A **700 MHz statewide** deployment in Maryland
- **HMARS** – Hospital Mutual Aid Radio System

Data

- **INETS or the NCRnet** will provide private, dedicated infrastructure to participating governments through a fiber optic and microwave backbone
- **Regional Wireless Broadband Network (RWBN)** will provide essential high speed, large volume throughput, on scene access and sharing by responders of critical information in the field via mobile (from vehicles) and portable (handheld) devices
- **Data Exchange Hub (DEH)** - Just as NIMS can facilitate coordination and communication between first responders from different agencies or jurisdictions, the DEH Services Oriented Architecture (SOA) holds the same promise to promote the flow of information between differing IT environment and legacy systems.
- **Emergency Operation Center (EOC) to EOC Communications** - Enable reliable, secure voice communications, text messaging and video conferencing between all regional EOCs and ECCs,
- **WebEOC** – Common Operational Picture through WebEOC
- **First Responder Authentication Credential** – FIPS201 compatible card for First Responder's Positive Identity Verification at incidents.
- **LIInX – Law Enforcement Information Sharing** Comprehensive local, state and federal law enforcement regional data sharing for entire NCR that will contain facial recognition investigative tools and be available wirelessly.
- **Automatic Fingerprint Identification System (AFIS)** – unified fingerprint identification system which will enable improved work flow, booking process, criminal identifications and enhanced mugshot capabilities.
- **Patient Tracking System** – on-scene to hospital incident centric patient tracking
- **RoamSecure** – email alerts via handheld devices expansions
- **NCR Syndromic Surveillance Network (ESSENCE)** – health trend surveillance network for disease

Collaboration with the Commonwealth's Interoperability Effort

To encourage collaboration between the statewide effort and the NCR, the Commonwealth Interoperability Coordinator serves as Virginia's representative on the National Capital Region Regional Programmatic Working Group for Interoperability (RPWG-I). To promote two-way communication, representatives from Northern Virginia also sit on the State Interoperability Advisory Group and participate heavily in Initiative Action Teams. It is anticipated that in FY 2007 the Commonwealth will leverage expertise within the NCR to implement common language, coordinate a state radio cache, and continue to collect lessons learned from the 800 MHz rebanding process among other items.

For information regarding any of the NCR's new or existing systems and initiatives please contact Robert LeGrande, 202-727-2189 or Robert.LeGrande@dc.gov.

Piedmont Regional Interoperability Project

I. The Nature of the Problem:

The City of Danville is approximately 44 square miles and is located in the southern most portion of Central Virginia, bordering the State of North Carolina. It is surrounded on three sides by Pittsylvania County, Virginia, which incorporates a 1000 square miles. Just across the border lies Caswell County, North Carolina. Even though we share a common geographic border, we currently lack a common communication system that allows for interoperability.

Criminal and traffic offenders alike flee law enforcement by crossing back and forth across the state line in an attempt to elude capture, resulting in a higher than normal number of high speed chases. During emergency events involving multiple agencies, a lack of radio interoperability is at best problematic. Pursuing units are relegated to utilizing a system of relayed messages conveyed via their respective agency's emergency operations centers through the use of landlines. The inability of field responders to communicate directly with each other wastes time and adds unnecessary delay in situations where every second counts.

Additionally, the regional area adjoining the City of Danville has suffered an economic downturn. This is due largely to the economic flight of the textile and tobacco industries. We understand that without our significant attention on safety and security, we will have little to no success in addressing the barriers to economic growth and social improvement.

Historically antiquated patterns of thinking led to investments in proprietary, non-interoperability technology. Many of the information and communication systems within the PRIP area are incompatible with one another. This condition has led to a crisis in public safety operations. In order to maximize limited resources, the region must move toward standards-based technology that seeks to create interoperability through simple system modification, instead of system replacement.

II. Approach:

- 1. Communication platform to support any technology medium***
- 2. Prioritize investments***
- 3. Local control of local assets...keeping control of assets***
- 4. Technology based on Worldwide standards***
- 5. Multiple mediums of communication...not just one***
- 6. Dual-use technology...not singular purpose.***
- 7. Accentuate not just radio...but Voice, Video, Data and Radio***

In the fall of 2005, Cisco Systems, Inc. and the City of Danville began discussing the possibility of testing a product that addressed the problem of radio interoperability. Cisco Systems had developed an integrated radio solution, which had been tested within smaller single agency venues. Looking for a multi-agency

environment for expanded testing, Cisco entered into an agreement with the City of Danville to test their product in a multi-jurisdictional pilot project that would address radio interoperability via an IP network.

The tentative project name is the "Piedmont Regional Voice over IP Pilot Project." The project involves a collaborative effort between Cisco Systems, Inc., Sprint/Nextel, National Institute of Justice CommTech Program, and a multi-agency consortium that includes the City of Danville, VA; Pittsylvania County, VA; Caswell County, N.C.; the Virginia State Police; and the North Carolina State Highway Patrol. Virginia Tech University is a non-participant observer assessing the project to study the future applicability of the technology.

The proposed system is designed to provide connectivity between desperate communication systems where none previously existed. The system does not extend existing networks, but simply allows on-demand connectivity between available resources during emergency or routine situations. The initial system deployment will provide unified voice interoperability using any voice enabled device, but subsequent versions will include data and video integration.

The implementation schedule has been defined in a three-phase approach. Phase one seeks to address the issue of operability within the City of Danville. Participants include public safety (police, fire, and EMS) and the Emergency Operations Center (EOC). Also included are the departments of utilities (water, gas, & electric) and public works. Phase II will initially incorporate the law enforcement and emergency services entities from the Counties of Pittsylvania, VA and Caswell, N.C. Phase III will expand the project to incorporate the two adjoining state police agencies; the Virginia State Police and the North Carolina State Highway Patrol.

The system utilizes an IPICS (Internet Protocol Interoperable Communication System) server and a system of routers deployed along the participating agency's radio networks to create IP connectivity. Features include multi-level authorization to define and enable individual or group users. Authorized administrative users have the ability to create talk groups over available channels and can limit their level of participation. Enhanced security features provide internal and external security to prevent intrusion by outside attackers.

III. Goals:

- 1. Plan with Information Sharing – Voice, Video, Data and Radio***
- 2. Connecting PSAP's***
- 3. Clear migration plan***
- 4. Strong governance***
- 5. Remote Dispatch Monitoring***
- 6. Investment protection***
- 7. Off the shelf technology***
- 8. More effective service to the public through direct communication***

- 9. Equality in resource command and control**
- 10. Reduced delay and distortion of information**
- 11. More timely and accurate transfer of information**
- 12. Partnerships...with regional and state agencies, Industry partners**
- 13. Economic Development**
- 14. Business Continuity**

For the first time ever, we are utilizing IP protocols to communicate via radio to cell phones and PC devices. We have the capacity to remotely monitor emergency communication traffic...from anywhere in the world where an IP connection exists.

V. Outcomes and Road Map

- 1. VA Tech is involved to assess the use of this technology in their economic development projects.**
- 2. Statewide implementation – “Connect the PSAP’s”**
- 3. Provide for those organizations who can’t afford to interoperate, yet want to**
- 4. Regional information sharing**
- 5. Process management and change.**
- 6. These statements should clearly defined path forward...solutions to prevention and preparedness...and the protection of our public safeguards.**
- 7. Right information – too much information is as a bad as too little.**
- 8. Often contextual information and situational information is the most critical type of information to share during an incident to facilitate and coordinate activities among collaborating responders.**
- 9. Today this information is shared by data and independent of voice, radio and video...with neglect to other types of intelligent based network information. Right time – as a situation changes, more or less information is needed**
- 10. Right format – specific types of responders such as fire, police, and health need different types of information that is tailored to their specific standard operating procedures.**
- 11. Right person – only authorized individuals should have certain privileges for access to information and responsibilities for command and control operations.**

Moving forward, our aim is to build a platform that supports multi-mediums of communication or various ways to communicate and share information. The PRIP project is designed to initially bridge disparate Radio communication systems. However, our goal is to simply add the capacity to share critical Voice, Data and Video information over a resilient, secure, IP platform.

This approach utilizes the standard IP technology - the same IP technology standards that were developed by DARPA over 35 years ago to withstand a nuclear attack.

As for the outcomes, our public safety personnel will be able to access information, interoperate in ways that have yet to be determined. Already, we have a new capability to interact with other agencies utilizing IP protocols.

The next wave of innovation for our project is to incorporate information sharing and video capabilities.

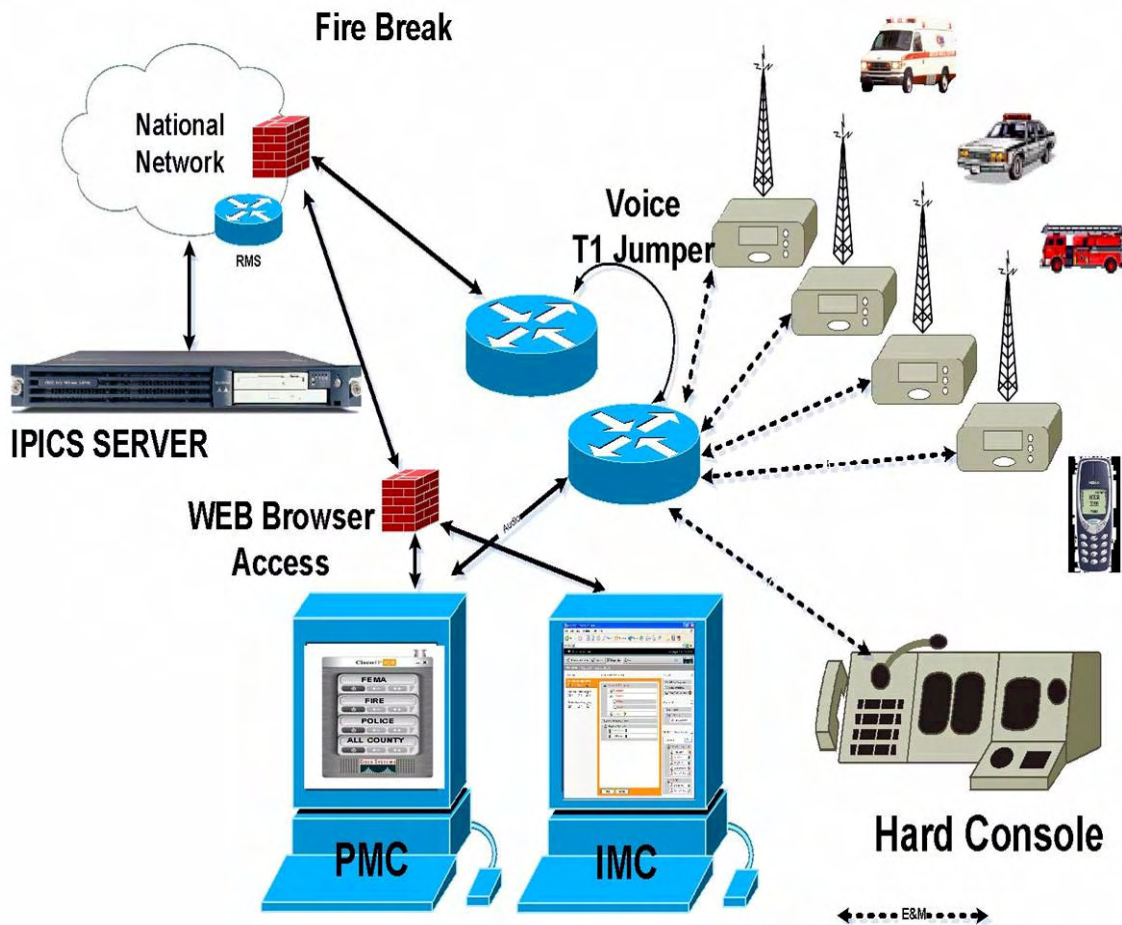


Figure 14: Piedmont Regional Interoperability Project

Contact Person for more information

Richmond Region

Over the past few years the Richmond area has been very pro-active with interoperability concerns and worked together to attempt to overcome a number of interoperability issues.

One of the first steps in this process was the purchase and installation of the Capital Region Radio System. Over the past several years, the Counties of Henrico, and Chesterfield and the City of Richmond have worked together to minimize radio communications barriers in these types of situations, as well as in day-to-day operations. All three jurisdictions have purchased 800 MHz Motorola digital trunked systems, linked through a Smartzone controller. The Smartzone software and controller allow individual radio users to seamlessly roam between the three jurisdictional sub-systems, provided they are on a talkgroup that has been designated as a wide area resource.

The three jurisdictions formed the Capital Region Communications Steering Committee and have worked together to ensure that policies and procedures are in place to take full advantage of the interoperability capabilities of the Smartzone Network. The three jurisdictions have created generic regional talkgroups that are programmed in all of the radios on the Smartzone Network. These generic talkgroups can be assigned by any of the three dispatch centers and can be used for any type of regional situation. In addition to the generic regional talkgroups, regional law enforcement talkgroups have also been created. These talkgroups are programmed into law enforcement radios and are used for specific purposes, such as regional vice operations or regional hostage situations. All of the talkgroups that are designated as regional talkgroups are programmed as wide area talkgroups, meaning they can talk throughout the entire coverage area of the Smartzone Network.

In addition to the designated regional talkgroups, the three jurisdictions have agreed to share certain key police, fire and general government talkgroups, with each other. These shared talkgroups are also designated as wide area and can be used throughout the entire coverage area of the Smartzone Network.

The console systems of the three jurisdictions are also linked through a common network and can be programmed to share resources.

Although a shared system is the best and most effective means of interoperability, the capital region and the other surrounding localities have worked together to come up with other means of interoperability as well. Colonial Heights has purchased a Motorola trunked system and has joined the capital region by sharing channels and talk groups. Through this console network, all three jurisdictions as well as Hanover have access to two National Public Safety National Advisory Committee (NPSPAC) calling channels and four NPSPAC

tactical channels which allows Hanover and the capital regional to communicate with each other and other 800Mhz users.

Henrico County has also processed a MOU with Hanover County to allow the Henrico dispatch center to patch Henrico talkgroups to the Hanover Enhanced Digital Access Communications System (EDACS) through a control station located at the Henrico communications center. Henrico is also working on a MOU with the State Police that would allow Henrico dispatch to patch the State Police Division One repeater channel to Henrico talkgroups. Once these two control stations are installed, Chesterfield County and the City of Richmond would have the capability of patching through the shared console network, provided they have a MOU with Hanover and the State.

With the use of the UASI and State Interoperability grant funding Hanover and Goochland will receive portable radios to operate on the capital region system for additional interoperability capabilities.

Aside from the region's 800Mhz capabilities, since the majority of the localities surrounding the capital region are VHF users, Chesterfield has worked out a control station patch setup with Powhatan and Hanover has patch capabilities with their surrounding localities by installing base stations for the Statewide EMS channel, a regional VHF fire mutual aid channel and SIRS. These channels can be used as conventional channel operations or patched into the 800Mhz system.

Lastly, with the UASI grant funding the capital region as well as Goochland and Hanover Counties are in the process of simulcasting the NPSPAC Mutual Aid channels across the region to improve the operation and will be connecting Goochland with the use of an ACU-1000. They will also be purchasing a portable tower unit which will be equipped with the five NPSPAC conventional channels for expanding the coverage area or for operations in areas outside of the Richmond area.

Collaboration with the Commonwealth's Interoperability Effort

To encourage collaboration between the statewide effort and the Richmond area, a representative from the region sits on the State Interoperability Advisory Group to share regional lessons learned and best practices.

For more information please contact XXXXXXXX

Rockingham-Harrisonburg Region

In January 2005 the Harrisonburg-Rockingham Emergency Communications Center (HRECC) started an \$18.9 Million project to facilitate seamless interoperable communications for the City and County's 60 public safety and public service Departments/Agencies. Previously, the stakeholders could not communicate over their disparate radio systems when responding to emergencies or while performing routine day-to-day tasks. In addition to an 11 site 800 MHz system implementation covering 850 square miles, a public safety paging system, VHF/UHF/800MHz mutual aid and high-capacity microwave data networks will be installed as a part of the overall radio communications solution.

The backbone of the communications system will include an 800MHz EDACS IP digital communications network with Project 25 Common Air Interface, which will provide users with comprehensive digital coverage. The new system replaces conventional VHF and UHF systems that did not provide ample coverage, afford adequate channel capacity or grant interoperable communications capabilities among various agencies in the City, County and neighboring municipalities.

The new system will equip public safety personnel in the region with an essential communications tool necessary to better perform their work. For the first time, the City of Harrisonburg and Rockingham County's police, sheriff, fire and emergency medical first-responders will be able to talk to one another and coordinate with other city and county service agencies on a single communications system -- enabling the 1700 users to act more quickly and efficiently in times of crisis, without awkwardly switching radios or attempting to patch in to remote dispatchers.

A system-level interoperability solution design will be developed that highly leverages day-to-day, large scale and wide area inter-system radio communication needs. The result will be a technically-intelligent but user-simplistic approach to interoperability with other radio systems in concurrent coverage area as well as surrounding municipalities. Leveraging the enhanced capabilities of the new digital Internet protocol based radio system and interfacing legacy radio systems will afford a high level of interoperability with no investment to mutual-aid users. Set up with mutual aid radios systems will not require technical set up or supervisory interaction. Interoperable communications will be an anytime, anywhere reality in the Harrisonburg-Rockingham radio system.

Collaboration with the Commonwealth's Interoperability Effort

The Director of the Harrisonburg-Rockingham Emergency Communications Center is a member of the State Interoperability Executive Committee as the APCO representative. This has allowed better coordination between the regional and statewide efforts.

For more information regarding activities in the Harrisonburg-Rockingham area please contact Jim Junkins, Director, Harrisonburg-Rockingham Emergency Communications Center at 540-434-2006.

Tactical Interoperable Communications Plan

Coming Soon

State Projects

Capital Wireless Information Net

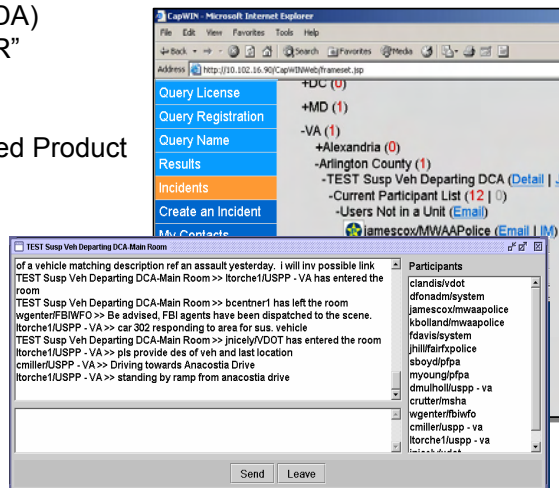
The Capital Wireless Information Net (CapWIN) program is a partnership between the Commonwealth of Virginia, the State of Maryland, and the District of Columbia to develop an integrated first responder communication and information sharing network to connect and provide critical data to first responders across jurisdictions and disciplines. Focusing initially on first responders in the field, this unique and challenging program has created the first multi-state and multi-discipline interoperable public safety wireless data system in the United States. CapWIN is a single, open, shared, and secure system for the public safety and transportation communities at all levels of government. CapWIN is part of the new umbrella organization, the Mid-Atlantic Communications Interoperability Partnership (MACIP), which has been established to provide an overarching structure to coordinate the operational overlap among public safety and transportation agencies.

CapWIN's current capabilities include:

- Incident Management (Structured Messaging)
- Access to 3 State Criminal Justice Databases from VA, MD, and D.C. (VCIN, MILES, WALES) as well as National Crime Information Center
- One-to-One & Group Communication (Public and Private Messaging)
- Global Directory with First Responder Profiles
- Multiple Form-factor Support (PC & PDA)
- National Library of Medicine's "WISER" HAZMAT Database Partnership
- Security (FIPS 140-2 Compliant)
- Technology Certified as DHS "Approved Product for Homeland Security"

For all public safety and transportation entities throughout Virginia, Maryland, and the District of Columbia, CapWIN is **immediately available at no cost.**

Agencies that wish to use CapWIN today need only acquire mobile data computers and wireless access to a commercial service provider, e.g., Verizon, Cingular, NEXTEL, etc., if they do not already have mobile data system. CapWIN's existing connections to multiple commercial networks provide secure access to the CapWIN application suite, including law enforcement databases. CapWIN's current network infrastructure also provides the opportunity for fixed station (desktop) access through existing state agency connections, e.g., COVANET (VA), Network MD, and the D.C. Wide Area Network.



Using CapWIN, agencies can instantly communicate across their organizations, including with field personnel equipped with mobile data computers. In addition, CapWIN users can instantly communicate with all other online users and access CapWIN's full User Directory which contains contact information and individual skill profiles for all users.

CapWIN has also recently released its first PDA client, which provides access through a connected PocketPC PDA to CapWIN's User directory, one-to-one messaging, and access to state/federal criminal databases. Since the cost of a connected PDA can be substantially lower than a mobile data computer mounted in a vehicle, the "cost of entry" to join the CapWIN community can be even less if a PDA can meet the operational needs of an agency.



Through CapWIN's enhanced messaging capabilities, smaller jurisdictions can use the CapWIN application as a dispatch solution, as well as for other operational tasks, e.g., "roll call" functions using group messaging functions. Agencies can create private discussions available only to their own users as well as "public rooms" open to the larger CapWIN community across agencies and jurisdictions.

As an example, the Waynesboro Police Department in the Shenandoah Valley of Virginia is using CapWIN via mobile data and desktop computers. Waynesboro plans to use CapWIN to support day-to-day operations including law enforcement queries, individual and group messaging as well as intra-departmental communications. As one of eight Virginia public safety and transportation agencies using CapWIN today, Waynesboro is also looking forward to communicating with other CapWIN users in neighboring jurisdictions and across disciplines.

As a system designed to "enable interoperability for first responders everywhere they are," connecting to CapWIN can assist smaller jurisdictions in qualifying for Federal and state grants, including Homeland Security Grants that now require agencies large and small to demonstrate how they are achieving interoperability. CapWIN enables interoperability "out of the box" by connecting users regardless of location or agency affiliation.

Query Name: Stringbean Leroy 09/16/1940 M W VA						
Query Results		Source Information				
Record Type	MILES	VCIN	WALES	NCIC	NLETS	OTHER
Concealed Weapon Permit		FM				
Deported Felon						
Drivers License		Reply: No Record				
Missing Person		FM		FM		
Parole						
Restraining Order						
Sexual Offender		Reply: No Record				
Stolen Vehicle/Plate						
Vehicle Registration		FM				
Violent Gang						
Wanted Vehicle						
Warrant		FM				
Other						

Confidential Draft Document

CapWIN software is currently free to local, state and Federal users across Virginia, Maryland and the District of Columbia. In the future, CapWIN plans to become a largely self sustaining organization through the collection of user fees.

To learn more about how to connect to CapWIN, including information on current users, hardware requirements and connectivity options, please contact Roddy Moscoso at rmoscoso@capwin.org (301) 614-3728.

Commonwealth's Link to Interoperable Communications

Mutual aid situations require that multiple agencies, from different jurisdictions and with incompatible radio equipment, be able to communicate effectively. The COMLINC (Commonwealth Link to Interoperable Communications) project leverages Voice over Internet Protocol (VoIP) technology that will allow disparate radio systems to communicate within Virginia. When implemented, COMLINC will interface with the STARS network and enable communications between local and state agencies by eliminating the roadblocks imposed by these incompatible radio systems that exist today. COMLINC will allow the Commonwealth to leverage existing investments in communication infrastructure by using VoIP technology to attain interoperable communications between localities, regions and state agencies.

COMLINC Options?

COMLINC is comprised of several VoIP solutions offered by various companies. The Motobridge IP solution is available for localities to purchase off the existing STARS contract. While this option is available to localities, many must conduct RFP processes when going through procurement and this can lead to another VoIP solution being selected. The objective of COMLINC is to allow all VoIP solutions to connect to STARS and various localities within regions to increase interoperable communications. If a locality chooses to go through an RFP process to procure a VoIP solution that will link up with STARS it is strongly encouraged that that locality coordinate with STARS to properly identify the technical and functional requirements to be used in the RFP. Failure to do so may result in many advanced radio features being unavailable.

Greater Control to Local Dispatchers and Systems

COMLINC allows dispatchers at the counties and cities to establish multiple patches to connect agencies within the jurisdiction or to other localities. One of the paths will come back to the STARS network that will allow connection to multiple state agencies. The locality dispatcher can use the other patches to connect agencies within the jurisdiction or to other localities. For example, a Sheriff's Department can patch to the Fire Department regardless of the frequencies used by each agency. Patches can also be made to phone networks and used to establish dispatcher conferences.

COMLINC will enable each dispatcher to initiate patches themselves at their console. If the Motobridge IP solution is used COMLINC will provide instant recall of recorded audio. It enables the use of advanced calling features such as Emergency ID, and allows monitoring of the interoperability network activity and associated operations. For agencies requiring end-to-end encryption, COMLINC provides AES encryption over the network. Thus, when agencies are operating

on AES-encrypted subscriber radios, end-to-end encryption will occur between the radio users. COMLINC is APCO Project 25 compliant. However it is important to note that many of these advanced features may not be possible if other VoIP technologies are selected. Localities and regions must work with STARS to develop the technical and functional requirements all technologies must obtain to become a part of COMLINC.

COMLINC will replace the single Radio Frequency (RF) dispatcher to dispatcher patches to localities and STARS state agencies.

Current COMLINC Projects

COMLINC represents an opportunity for localities to maintain current communication systems and create interoperability between disparate systems within the region. COMLINC also allows regions to tap into the Statewide Agencies Radio System (STARS) which supports Virginia State Police and 20 other state agencies. The State Interoperability Executive Committee (SIEC) has endorsed COMLINC. Figure 13 shows where COMLINC is being built across the Commonwealth.

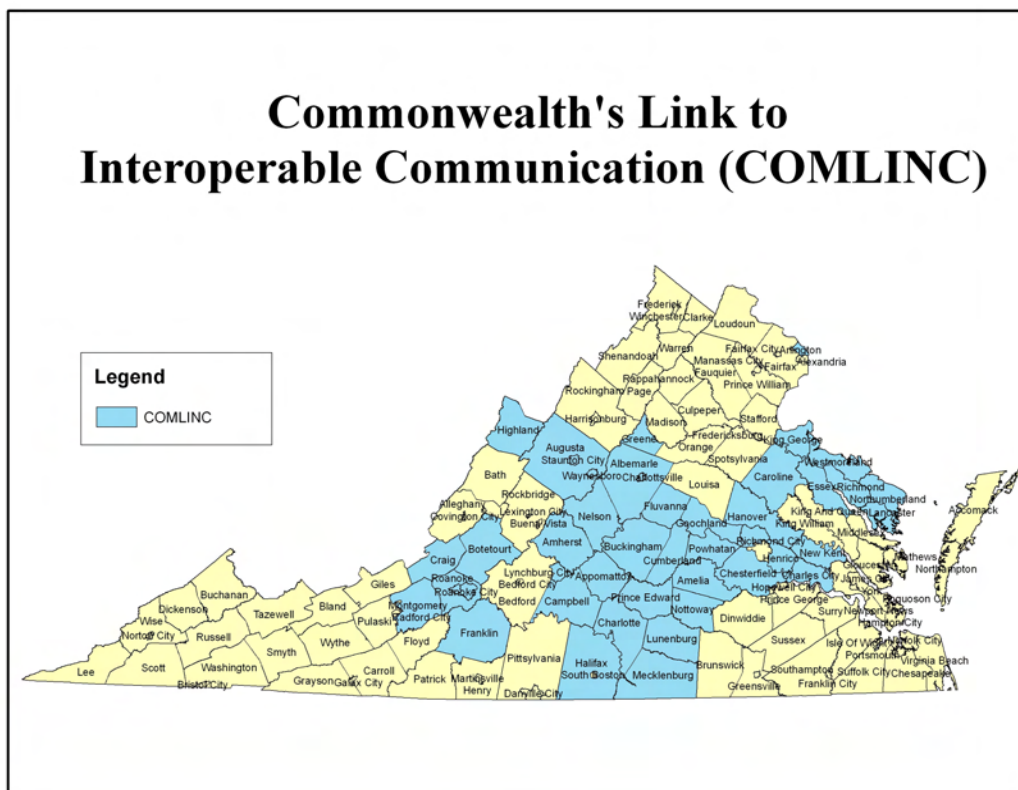


Figure 15: COMLINC Implementation Locations

The STARS Project Team is working in conjunction with the Commonwealth Interoperability Coordinator, State Interoperability Executive Committee, and the Virginia Information Technologies Agency (VITA) to ensure that all VoIP technologies that are considered for COMLINC meet certain technical and functional requirements. This collaboration is also working to ensure that ongoing costs localities will pay to leverage this technology are reduced by using economies of scale.

The information below describes these current COMLINC projects:

Region 1

Region 1 was awarded \$1.5 Million from the Office of Domestic Preparedness (ODP) through the Commonwealth Preparedness Working Group to pilot a COMLINC project to link up 14 of the region's 25 localities. Implementation will be complete by June 2006. Participating localities include Powhatan County, Caroline County, Richmond County, Hanover County, Essex County, Chesterfield County, Goochland County, Northumberland County, Lancaster County, Henrico County, New Kent County, Charles City County, King George County, and Westmoreland County. The Region 1 COMLINC project is using the Motorola Motobridge IP solution.

Region 3

The Lynchburg Metropolitan Statistical Area (MSA) was awarded approximately \$1.4 Million by the U.S. Department of Justice, Office of Community Oriented Policing Services (COPS) Interoperable Communications Technology FY 2005 Grant program to implement COMLINC within Region 3. Lynchburg is currently compiling an RFP to provide a VoIP solution that will link up the region's disparate radio systems.

Region 6

The Roanoke Metropolitan Statistical Area (MSA) was awarded \$866,570 by the COPS Interoperable Communications Technology FY 2005 Grant program to implement COMLINC within Region 6. The Roanoke MSA is leading efforts to increase the number of localities participating in this project. The Roanoke MSA is implementing the Motorola Motobridge IP solution.

Local Interoperability Grants

In FY 2006, the SIEC awarded \$75,000 each to Amelia County, Nottoway County and Montgomery County to implement COMLINC. These localities plan to implement the Motorola Motobridge IP solution.

For more information about COMLINC please contact Captain Michael Bolton at (804) 674-2443 or the Commonwealth Interoperability Coordinator's Office at 804-225-3800.

State Interdepartmental Radio System

SIRS is a low band frequency 39.54 MHz system developed in 1978 that is used statewide by local law enforcement to communicate between localities and the Virginia State Police (VSP). SIRS has four primary goals:

- Direct, real time car to car radio communications between law enforcement agencies
- Provide radio communications during prisoner transports
- Provide interoperability between localities and also with VSP
- Provide a highly reliable network

SIRS is not to be used for routine radio traffic, since this type of use will flood the system. This system provides the ability for direct interoperability and does not rely upon a dispatch function for those with SIRS equipment.

SIRS is governed by the SIRS Advisory Board, which is appointed by the Secretary of Public Safety. The SIRS Board is responsible for policy formation, eligibility for membership, and research on matters relating to public safety communication problems affecting the Commonwealth's ability to deliver effective law enforcement services.

SIRS is widely used by rural localities to communicate with VSP on a daily basis as many of these localities still operate on low band radio systems. Many localities have migrated to 800 MHz and high band radio systems. These situations require a patch or interconnectivity to continue the use of SIRS. In some cases 800 MHz users have discontinued their use of SIRS due to the costs associated with maintaining two systems.

The 39.54 MHz frequency continued to be used throughout Virginia to link up local law enforcement with VSP providing true interoperability, which increases public safety. While this system is over 30 years old it is still widely used and effective.

For more information about SIRS please contact Sheriff Farrar Howard at (804) 966-9502.

State Tactical Resources

In light of the communication system failures during and following the events of 9/11, these tactical solutions could save countless lives and property by being deployed to assist the public safety community.

The Commonwealth has worked to develop tactical solutions that can be deployed to a situation within a few hours of an event to provide tactical communications interoperability. These communication assets will assist the Commonwealth in establishing communications in the aftermath of large-scale events.

Some of the more significant tactical interoperability resources the Commonwealth currently has to offer include:

Virginia State Police (VSP)

- Three command posts in Northern, Central, and Western Virginia that can be en route to an incident within two hours to create tactical interoperability.
- Fifteen radios at each of the seven division locations that can be deployed to a situation and handed out at the scene—primarily to the incident management team—to establish some tactical interoperability for radio communications.
- Eight Incident Commander's Radio Interface (ICRI) units that can allow up to five public safety agencies to achieve radio interoperability. The ICRI units can also be linked together to increase this number to ten radios. These units can operate on battery power (24 hours on eight "AA" batteries) or on electricity if available. VSP also plans to deploy a radio technician with these units to assist with the deployment of these units.

To request Tactical Interoperability Solutions from the Virginia State Police please call the (804) 674-2176 during normal business hours. After hours, please contact the duty sergeant at (804) 674-200.

Virginia Department of Emergency Management (VDEM)

- One mobile command post and one communications trailer located in the Richmond region that contain VHF High band, VHF low band, UHF, VSP radio, VHF Marine, VHF Aircraft, civil Air Patrol, cell phone, and Satellite (SATCOM) communication capabilities. These command posts can be deployed within two hours of an incident, plus drive time, and contain or will contain ACU-1000 units that will allow up to 24 connections to various radios and telephones.
- Two portable 60-foot towers and one portable 75-foot tower located in the Richmond region that can be deployed to an incident; 60 foot towers have shelters for equipment mounted on trailers and generators, 75 foot tower

does not have shelter or generator onboard. They can strengthen a repeater's signal to increase the communication footprint at an incident.

- Two brief case satellite phones that can be requested and deployed to a scene.

Virginia Information Technologies Agency (VITA)

- A portable UHF 20-watt repeater and 30-35 UHF portables that can provide communications coverage within a 2-5 mile radius. Additional programmable UHF radios can be used to increase the 30-35 UHF portables that are deployed with the system. These resources are located in the Richmond region.

If localities or regions need to request these resources during or after an event they should contact the Virginia Emergency Operations Center at (804) 674-2408 or (800) 468-8892.

Statewide Agencies Radio System

The Statewide Agencies Radio System (STARS) Program will facilitate the communications of 21 participating state agencies by upgrading the existing Virginia State Police land mobile and microwave radio networks. STARS will create an integrated, seamless, statewide, wireless voice and data communications system designed to meet the needs of these agencies. The system will be shared by agencies engaged in public safety, protection, and service; and will facilitate interoperability with and between localities at the county and city level. STARS includes federal users and allows interoperability with their facilities within the Commonwealth. To accomplish this, the program will: increase capacity, upgrade the technology, and enhance coverage of the land mobile radio network; upgrade the technology of, and create disaster recovery alternate paths for the microwave radio network; and implement statewide law enforcement mobile data.

Connecting state agencies that respond to both routine public service requirements, and to emergencies, often requires coordination of multiple agencies. By facilitating interoperability with and between localities at the county and city level, the Commonwealth of Virginia Statewide Agencies Radio System (STARS) will enable agency responders – wherever they are located, on whatever radio platform – to seamlessly communicate as one, facilitating the move from independent operation to interdependent collaboration and cooperation.

STARS utilizes the Project 25 Standard for Interoperability

STARS builds upon the already powerful State Police Land Mobile Radio (LMR) network – upgrading it with state of the art, Project 25 (P25) technology. The P25 standard and the TIA-102 suite of specifications has been developed collaboratively by multiple user disciplines throughout the country, and by radio manufacturers around the world. STARS provides P.25 multi- channel, trunked integrated digital voice and data wireless communications specifically designed for public safety requirements. The adoption of the P25 standard and protocols for STARS allows P25 equipment from many manufacturers to operate on the STARS voice network. However, all equipment will need to be specified by STARS engineers (due to the complexity of TIA-102) and tested to ensure it is compatible with the current configuration of STARS.

STARS extends coverage throughout the Commonwealth... even in tunnels

STARS provides VHF integrated voice and data and 800 MHz wireless communication coverage for six tunnels in the Commonwealth (Big Walker Mountain, Hampton Roads, Elizabeth River Downtown, Elizabeth River Midtown, Monitor/Merrimack, and East River Mountain). The design allows for effective mobile radio, portable radio, and mobile data communications within these tunnels. In addition to being designed for STARS, the tunnel design also accommodates existing VSP communication channels to increase the

effectiveness of the overall Commonwealth migration to STARS. The tunnel design in the Tidewater area has been expanded to allow communications in the tunnels to those localities operating in the geographic areas adjacent to the tunnels on separate 800 MHz channels.

Digital Vehicular Repeater System (DVRS)

The STARS digital trunked infrastructure is designed to work with VHF mobile radios in 14 communications zones with between 88% and 95% geographic coverage both on land, inland waterways, and ten miles out to sea. To extend coverage to portable radios, STARS will include a Digital Vehicular Repeater System (DVRS), which will translate the VHF signal used between the fixed infrastructure (towers) and vehicle, into a 700 MHz signal used for localized vehicle-to-portable communications. Use of the DVRS will allow communications to be encrypted and secure over the entire radio circuit from the originator to the recipient. It will also carry many features of the trunked technology to the portables.

Supporting Mobile Data

In addition to voice, STARS enables access to data needed for the law enforcement users. It will enable them to be better prepared and informed for officer safety and for enhanced decision making during critical situations.

STARS will employ an Integrated Voice and Data (IV&D) land mobile radio architecture that uses the same mobile radio for both voice and mobile computer communications. Integrating the voice and data networks saves the Commonwealth the significant expense of a separate fixed data infrastructure with an additional radio/modem in each vehicle. IV&D will maximize spectrum efficiency and provide the same statewide coverage as the voice portion of the network. The IV&D infrastructure will also provide Over-the-Air Re-Keying (OTAR) of the radio's AES encryption. This allows the encryption codes resident in the vehicle's equipment to be managed remotely.

The mobile data capacity of the STARS IV&D system will be limited, due to the necessity to prioritize voice communication higher than data communications. Even with this limitation, the system will support the law enforcement users in the field:

- Remote access to law enforcement databases (including VCIN, NCIS, NLETS)
- Intra- agency and inter- agency text messaging
- Interfaces with Virginia State Police (VSP) Computer Aided Dispatch
- Interfaces with Department of Game and Inland Fisheries Computer Aided Dispatch
- Automated Vehicle Location (AVL) using the US Military's Global Positioning System (GPS) to assist mobile data users.

Transportable Site

The STARS Transportable Site is a self-contained and portable radio system. It consists of a five channel P25 system with 50 portable radios operating in the 800 MHz band. The transportable site will also contain the following: SIRS Radio, STARS Radio (VHF), DVRS, ACU-1000, 800 MHz, and satellite telephone. Radios from other systems may connect to the ACU-1000 (if provided on scene and the proper interface cables are available), with immediate interoperability between the connected radio systems. Thus the transportable site will allow interoperability within common radio systems and among disparate radio systems.

Robust, fault- tolerant, secure – serviceable for years to come

STARS Microwave and IV&D Networks uses a redundant, fault- tolerant, hierarchal design that allows for rerouting in case of single point failure. .

The STARS Network Fault Management (NFM) Network manages transmitter site/equipment alarms and controls various site functions. The NFM subsystem collects data automatically, and processes it for presentation to decision makers in the Network Operations Center (NOC). These management tools provide monitoring equipment and systems alarms for the Microwave and IV&D Networks. The data is used to operate the network, analyze the flow of site alarm and system control data, offer system solutions and handle pre-defined alarm situations automatically. The system generates reports for the engineers and operators administering the network.

The Network Operations Center (NOC) at the State Police Headquarters (SPHQ) houses personnel on 24/7 basis to identify, remotely correct alarm conditions or dispatch technicians. These same personnel also operate a help desk to assist users.

STARS Agency Members

- Alcohol Beverage Control
- Capitol Police
- Chesapeake Bay Bridge & Tunnel Police
- Conservation and Recreation
- Corrections
- Charitable Gaming
- Emergency Management
- Environmental Quality
- Fire Programs
- Forestry
- Game and Inland Fisheries
- Health
- Juvenile Justice
- Military Affairs
- Mines, Minerals, and Energy
- Motor Vehicles
- State Police
- Transportation
- Virginia Information Technologies Agency
- Virginia Port Authority
- Virginia Marine Resources Commission

About UARC

The User Agency Requirements Committee (UARC) is a group comprised of two persons from each of the 21 agencies that have agreed to join STARS. The Commonwealth Interoperability Coordinator is also a member of the UARC as an advocate for the State Interoperability Executive Committee and Office of Commonwealth Preparedness. These persons meet at least quarterly to discuss progress, updates and issues, and to share their experiences in implementing STARS.

The key UARC objective is to ensure their agency's unique requirements are identified and documented. Another objective is educational: providing STARS users with the information they need to operate a new system.

There are two ways localities and other state agencies can communicate with STARS:

1. Each county and city in the Commonwealth can be provided access to STARS. This patch will be activated for use by a STARS dispatcher, and will be able to interface any radio system, regardless of frequency band, technology, or manufacturer. This can be accomplished via radios located at STARS transmitter sites or COMLINC located at the locality or agency communications centers.
2. Entities including other state agencies and localities, with sufficient VHF radio frequencies for their use, will be able to join STARS through a needs-based assessment process. The new spectrum must work within the framework of the existing channel plan and equipment, and fund the infrastructure upgrade with transmitters using their channels. They would also need to purchase STARS compatible subscriber equipment and dispatch consoles directly or use the State Contracts.

STARS – Reaching across the Commonwealth

STARS is now operational in the Richmond area, which includes 21 counties and four cities.

Currently contracted operational stages:

- Richmond - December 2005 (Currently Operational)
- Tidewater - May 2008
- Culpeper - July 2008
- Northern Virginia - October 2008
- Salem - April 2009
- Appomattox - May 2009
- Wytheville - September 2009

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It is expected that the Tidewater area will have the Microwave Network operational and the IV&D Network ready for coverage testing in January 2007.

For more information about STARS please contact Captain Michael Bolton or the STARS Program Management Team at (804) 674-2443.

VITA Integrated Services Program (ISP)

The Virginia Information Technologies Agency (VITA) created the Integrated Services Program by consolidating the Virginia Geographic Information Network (VGIN), Public Safety Communications (E-911) Division and the two State radio engineers (formerly in VITA Telecommunications). The goal of this reorganization, which took effect on May 16, 2006, is to streamline and improve the delivery of existing and future services for public safety and emergency management. By leveraging the strengths of both programs, the ISP can be more responsive to the changing needs of the localities and state agencies.

In addition to the collaboration with VGIN through the creation of the ISP, the E-911 program staff continues to collaborate with the localities on the deployment of E-911 (both wireless and wireline). At present, more than 99% of Virginia's population is served by wireline E-911 and more than 95% is served by wireless E-911. However, even before the project to address wireless E-911 is complete, the next major challenge to the E-911 system has emerged. That challenge is voice over Internet protocol (VoIP) since VoIP service may not provide interconnection to the local E-911 system and can originate calls from anywhere on the Internet (not from a fixed location). To respond to this challenge, a major overhaul of the E-911 system will be required due to the current system's inability to process data and to route 9-1-1 calls from remote locations. This overhaul will drive a fundamental change in the way the E-911 network is viewed and provisioned.

Of significant interest to the issue of interoperability is that the future E-911 system will be an application on a shared network rather than a stove-pipe network that only supports the reporting of emergencies. As a result, VITA is expanding the view of the statewide telecommunications network to include a high-reliability, managed IP-based network to all localities within Virginia. Part of this infrastructure already is planned for and funded through the partnership agreement between VITA and Northrop Grumman for the modernization of the IT infrastructure within the Commonwealth. The partnership agreement calls for the enhancement of the backbone of the telecommunications infrastructure that will provide a point of presence in each of the seven (7) rate centers in the state.

To expand that backbone to each locality, VITA and Northrop Grumman are working with all of the potential users of this network in the localities to define the requirements for their applications to ensure the network will support them. The Statewide Interoperability Executive Committee (SIEC) will be a critical partner in this requirements definition since this network can be utilized to support both voice and data interoperability between the localities and state agencies. It provides the foundation to support the information sharing in the future.

Another application that this network will support is the Geospatial Enterprise Platform (GEP). The GEP provides the platform for the central hosting and sharing of geospatial data within a geographic information system (GIS). GIS software allows users to map and spatially analyze data. Local Governments in Virginia have rapidly adopted GIS technology to support E-911, tax mapping, utility mapping and planning. In addition, at least 25 state and 12 federal government agencies are using GIS technology in Virginia to support activities such as transportation planning, economic development, public safety, resource protection, and more.

Three critical factors affect interoperability in geospatial technologies:

- (1) Geospatial data specification (i.e. scale, projection, format, etc.)
- (2) Geospatial software formats
- (3) Enterprise systems

Geospatial Data

VGIN established the Virginia Base Mapping Program (VBMP) in 2001. This program's goal is to establish and maintain one consistent, accurate, foundational digital base map (geospatial data foundation) upon which local government and many regional, state, and federal geospatial data applications could be built, producing an efficient statewide geospatial infrastructure.

In 2002, the Virginia Wireless E-911 Services Board funded the VBMP, in support of statewide implementation of federal requirements for E-911 emergency response services for cellular phones. High-resolution digital orthographic photography was acquired for the entire land base of Virginia in the spring of 2002.

In February 2003, VGIN began delivery of a DVD set including high-resolution digital orthographic photography covering the county/city, as well as imagery for adjacent communities to each of Virginia's 134 independent cities and counties, including 128 E-911 Public Safety Answering Points (PSAPs). Such regional coverage was essential to meeting the mutual response obligations of local E-911 operations. To provide updated imagery to all users, the photography will be captured again in 2007 and every four years, thereafter.

The VBMP statewide imagery has produced a single consistent, seamless base map, providing the foundation for a consistent, enterprise architecture for GIS throughout Virginia. A seamless, high-quality base map ensures that data sharing for state and local, public and private business applications, including E-911 response, public safety planning, permit tracking, natural resource protection, transportation planning and economic and labor analysis, operate at the highest possible efficiency and can be consistently applied anywhere in Virginia.

In 2004, VGIN further leveraged the VBMP by establishing a collaborative program across all of Virginia's local governments to produce a seamless digital road file with road names and addresses. The VBMP road centerline (RCL) establishes a statewide "standard" for road/highway mapping and addressing in Virginia. The statewide file will be maintained by VGIN in collaboration with all of Virginia's local governments and the Virginia Department of Transportation (VDOT). In addition, VGIN has acquired or produced seamless statewide digital files for hydrography, rail, and a digital terrain model (a three-dimensional model of the surface of the earth). VGIN also is working with neighboring states to share geospatial data allowing VGIN to extend Virginia's digital base map up to 50 miles into our neighboring jurisdictions ensuring our border communities have the data required to meet their geospatial application needs.

Finally, VGIN, under a grant from the Governor's Office of Commonwealth Preparedness (OCP), is coordinating the acquisition (and ultimately standardization) of more than 70 additional public safety related geospatial data layers for inclusion in the Virginia Readiness, Response, and Recovery GIS (VR3). The VR3 is designed to provide public safety officials and decision makers a "single tactical landscape" for evaluating public safety data and events through secure Internet access. The first phase of the VR3 established the platform for the system that serves as the foundation for data storage and hosting the web-based applications; and developed a proof of concept application to be used for further development. A second grant from the OCP will fund the second phase of the project for the development of the full application and data layers. VGIN currently is working with the Virginia Department of Emergency Management (VDEM) to define all of the user requirements for the VR3. Development or acquisition of an application will follow development of the requirements.

Geospatial Software

The Commonwealth of Virginia has been fortunate that 95 percent or more of the geospatial installations in the state use GIS software from Environmental System's Research Institute (ESRI), the largest and most rapidly growing geospatial software vendor. This software commonality removes many obstacles to interoperability in GIS. In addition, VGIN follows guidelines and works with the Open Geospatial Consortium, Inc, which has addressed geospatial interoperability since the early 1990's.

Geospatial Enterprise Services

Under the direction of the Information Technology Investment Board (ITIB), the Commonwealth's Chief Information Officer (CIO), and the VGIN Advisory Board, VGIN has established several consolidated geospatial enterprise services in order to provide a more effective and efficient means of supporting geospatial

technologies across all constituencies in the Commonwealth. These services will include:

- One Stop Geospatial Information Portal – Access to a catalogue of geospatial contacts and resources across all constituencies in the Commonwealth.
- Metadata Clearinghouse – A consolidated catalogue of geospatial data assets maintained by state, local, and federal government organizations across the Commonwealth. The Metadata clearinghouse follows federal and state formatting standards and includes a search tool, which will allow users, and the public to search for, identify, and evaluate Virginia's geospatial data assets.
- Virginia Geospatial Data Library and Exchange Services – One-stop access to geospatial data assets that can be interactively selected, formatted and downloaded for local use.
- Internet Mapping Services – Access large or rapidly changing geospatial data layers (i.e. VBMP imagery, VBMP road centerlines) and integrate them into local applications without the overhead of local storage and maintenance.

Ultimately, the VBMP, consistent GIS software, enterprise services, and statewide collaboration have together established a consistent, statewide foundation for geospatial products and services, unprecedented interoperability across jurisdictions, and a statewide geospatial infrastructure that will support the greatest efficiencies in the sharing of data and applications.

Though driven in part by the need for a new E-911 network, the statewide telecommunications infrastructure will support the needs of several applications including enterprise GIS services, E-911 and interoperability solutions for both voice and data. For this project to be successful, all potential users must collaborate to identify the key design requirements to ensure that all users' needs are met.

Contact Information

Virginia National Guard

Current State:

The National Guard was dual-tasked in the past. In wartime, the nation expected the National Guard to fulfill its mission overseas; in peacetime, the nation expected the National Guard to be available for domestic emergencies. Since the terrorist attacks of September 11th, however, the National Guard is being called upon to do both at the same time, not by accident but because our nation's enemies may attack us in both places at once. The Defense Department and the Commonwealth of Virginia have depended heavily on the National Guard to the point that many of the nation's as well as state's accomplishments would not have been possible without the Virginia National Guard (VaNG).

Several critical Homeland Security and Homeland Defense missions have been assigned to the VaNG, which requires a much more expansive communications capability. Interoperability with federal, state, and local authorities is the prime requirement. Current VaNG communications capability during emergencies where standard telephone and cellular service are not available or reduced is limited to the Department of Defense's (DoD) Single Channel Ground and Airborne Radio System (SINCGARS) and a small quantity of High Frequency Band (HF) Radios. This system, while adequate for communication between Army units in a tactical field environment and with VaNG personnel in fixed locations (National Guard Armories), does not provide the capability to communicate with federal, state, and local agencies to an adequate degree. Mobile and portable communications are very limited. In addition, as a result of the Global War on Terrorism with deployments to Iraq and Afghanistan, the availability of SINCGARS radios has been diminished.

The 34th Civil Support Team (34th CST) is assigned to the VaNG. This unit has equipment configured for mobile and portable communications, which are adequate to meet current requirements. However, the 34th CST's mission is to respond to a Weapons of Mass Destruction (WMD) strike and is subject to be called away worldwide within 48 hours notice. Also, the 34th CST does not have enough of the required equipment for the VaNG to support the Commonwealth overall.

Desired Future State:

The VaNG seeks Interoperability as defined by DoD, which is "the ability of systems, units or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together."¹ The desired future end state for the VaNG is to be interoperable at all levels of command with Public Safety Agencies at the local, state and federal levels within the geographic boundaries of the Commonwealth

¹ Department of Defense, Joint Publication 1-02

of Virginia. Also to identify and train VaNG personnel to operate all Public Safety communications equipment and integrate all systems to protect and defend the Commonwealth.

The VaNG must obtain a higher level of Interoperability with all military responders and local, state, and federal agencies responding to natural and man-made disasters. By increasing the current capability from one disaster location to the ability to respond to multiple disasters in various geographic areas of the state, the VaNG seeks to expand its communications capabilities such that it can transmit and receive at the HF, VHF, UHF, 700/800 MHz, SATCOM and Ku Band Satellite systems. This requirement implies fixed, mobile, and portable platforms, operating at a Level 3 of Interoperability. By the purchase of a JPS-Raytheon ACU-1000 cross band repeater and various mobile and portable radios and repeaters, such as the Incident Commander's Radio Interface we will enhance the ability to achieve Level 5 Interoperability. This also includes one (1) 34th CST – Unified Command Suite (UCS), which is already deployed, to become a Statewide Agencies Radio System (STARS) user, having statewide Interoperability with local, state and federal responders. It also includes one (1) additional UCS to be assigned to the Joint Force Headquarters- Virginia (JFHQ-VA) of the VaNG and designated as the Adjutant General's Tactical Command Post.

Secret Internet Protocol Router Network (SIPRNET) and Non-secure (Non-Classified and Unclassified) Internet Protocol Router Network (NIPRNET) data channels are required in order to provide the ability for secured and unsecured voice, data, and video (Secure VTC) communications. Finally, a failsafe means of communications with the Virginia Emergency Operations Center is required, utilizing microwave technology to and from the VaNG Joint Operations Center (JOC).

Training through annual exercises with the above described communications equipment is part of the desired future end state as are redundant power sources, transportation resources, equipment storage, and operator and planning personnel.

The Justification for Change:

Under certain emergency conditions the VaNG is required to assume responsibilities for missions currently covered by other agencies such as the U.S. Border Patrol, which is funded by the Justice Department, the Drug Enforcement Agency, the Bureau of Alcohol, Tobacco and Firearms and possibly even the Federal Bureau of Investigation. Because of this the DoD recently released the Strategy for Homeland Defense and Civil Support, a first-ever document that addresses DoD's roles in the homeland defense mission and support to civil authorities. The Strategy for Homeland Defense and Civil Support articulates strategic goals and objectives and provides direction to relevant Homeland Defense activities across the nation. These activities include deterring and

preventing attacks, protecting critical defense and designated civilian infrastructure, providing situational understanding, and preparing for and responding to incidents. The strategy transforms homeland defense and civil support capabilities and will improve significantly DoD's ability to counter threats of the 21st Century.

The strategy defines strategic objectives in a "lead, support, enable" framework. The department has the lead role in providing for the defense of the United States, is an important government partner in providing support to civil authorities, and actively seeks to enable domestic and international partners to improve their homeland defense and homeland security contributions. The strategy focuses on building needed transformational capabilities, enhanced maritime awareness and response capability, strengthened allied contributions to collective security, and improved support to civil authorities.

When directed by the Governor or appropriate state authority, VaNG forces and assets in state active duty status must respond quickly to perform homeland defense and homeland security activities within the geographic boundaries of the Commonwealth of Virginia. Newly expanded authorities under Title 32 of the US Code – and the VaNG on-going transformation – provide the Governor and state authorities with the authority to use flexible responsive VaNG units to perform homeland defense activities, when approved by the Secretary of Defense. For example, VaNG forces may, when the Secretary of Defense determines doing so is both necessary and appropriate, provide security for critical infrastructure and support civilian law enforcement agencies in responding to terrorist acts.

The VaNG simply must improve its Interoperability and must do so now. As stated above, we do not have the equipment, personnel, or training to accomplish our Homeland Security/Homeland Defense missions.

Requested Support From the Commonwealth of Virginia:

Our strategy for achieving Interoperability consists of two key objectives. First, at some future point the VaNG will receive communications equipment in limited quantities from various DoD sources, such as the U. S. Army and the National Guard Bureau. We are now and will continue to be assertive in obtaining the equipment on an expedited schedule. We intend, in other words, to do what is necessary to move the VaNG "ahead of the pack" for equipment fielding. Second, and more importantly, we request support from the Commonwealth of Virginia. We are committed to working closely with The Commonwealth Interoperability Coordinator's Office (CICO) to achieve the support and communications equipment necessary to be Interoperable with state and local agencies. We request that CICO establish an Initiative Action Team (IAT), consisting of members from the VaNG and experts to achieve Initiative 6 of next year's Strategic Plan for Communications Interoperability, which is to "Increase coordination and collaboration between CICO and the VaNG to leverage its unique federal/state capabilities.

WebEOC

WebEOC is an incident management system recently purchased by the Virginia Emergency Operations Center (VEOC). Because the information is Web-based, real-time incident viewing and tracking is available to authorized users anywhere in the world.

The fact that Maryland and the District of Columbia (DC) EOCs currently use WebEOC, allows Virginia to share incident information with our neighbors easier than ever. Jurisdictions, state agencies, other states, and various support personnel will potentially be able to enter data and view status boards through WebEOC during emergency situations - without purchasing the product. This allows all concerned agencies and jurisdictions to have available the same real-time information simultaneously.

Jurisdictions and state agencies that choose to purchase the WebEOC software will be able to customize it to their needs. It is possible to enter data on one system and have it forwarded to VDEM's version of WebEOC. This avoids dual entry of data - saving time, effort, and money. Links to agency specific sites, such as Geographic Information Systems (GIS) data and Homeland Security Information Network (HSIN) data, can be made through WebEOC. WebEOC also has its own email and chat functions so that sensitive data can be shared among authorized users without being compromised.

WebEOC is a user-friendly product and can be modified and customized to meet the needs of specific agencies. User IDs are used to control access to WebEOC and control what data is viewed, what data can be updated, and what data can be deleted.

Through the use of WebEOC, jurisdictions, state agencies, and support personnel will have access to timely and useful data, which will help to eliminate the need for redundant efforts and dual entry of data. All authorized users will have access to timely information in the formulation of decisions. Status boards can be shared among users. This allows for the interoperability of efforts among all affected during an emergency.

For more information on WebEOC in Virginia please contact Harry Colestock at (804) 674-2400.

Virginia Department of Health Communications System

Coming Soon

Federal Projects

800 MHz Rebanding

800 MHz Rebanding²

Public safety radio systems operating at 806-824 MHz/851-869 MHz — conventionally known as "the 800 MHz band"—are experiencing increasing levels of interference from commercial wireless carriers, such as Nextel and the cellular carriers which operate in the same part of the spectrum or in adjacent spectrum bands. A number of private radio systems also operate in the 800 MHz band. For example, utility companies use the spectrum for internal communications; but it appears these private radio systems are not a significant source of interference to public safety radio systems.

Interference to 800 MHz public safety systems is primarily caused by the fact that public safety systems and commercial wireless systems operating in nearby spectrum use fundamentally different system architecture. Public safety systems traditionally use a single base station with a high antenna in a favorable location within the desired coverage area. The transmitted signal will be strongest near the base station and weaker in locations further away from it. Consequently, public safety systems use receivers that can receive relatively weak signals.

Commercial wireless services, including those operating in the 800 MHz band, have become extremely popular over the past few years and expanded dramatically in terms of both subscribership and usage. The commercial wireless carriers typically accommodated the resulting large volume of communications traffic by employing solutions that increase the efficiency of use of their spectrum (specifically, "frequency re-use", which permits the available communications channels throughout a service area to be used to their maximum potential). This generally requires a "cellular-type" architecture consisting of a large number of base stations, using relatively high power, but relatively low-site antennas to limit coverage to a small area around that base station. To increase capacity in response to subscriber demand, the commercial operators must often build additional base stations — i.e., "cells".

For many years, public safety radio systems operated in the 800 MHz band with only occasional harmful interference. The original band plan did not anticipate the development and accelerated growth of the commercial wireless carriers using 800 MHz cellular-type architecture systems.

800 MHz public safety radio systems became more widespread and commercial wireless systems saw dramatically increased subscribership resulting in more vigorous reuse. This involved a greater number of cell sites and a greater

² Federal Communications Commission. [About 800 MHz Band Reconfiguration.](http://wireless.fcc.gov/publicsafety/800MHz/bandreconfiguration/about.html)
<http://wireless.fcc.gov/publicsafety/800MHz/bandreconfiguration/about.html>

number of frequencies in use at those cells. Consequently, public safety users began to encounter pockets of "dead zones" within their coverage areas, where the signals from commercial wireless systems overwhelmed the sensitive public safety receivers.

On March 15, 2002, the Commission released a Notice of Proposed Rule Making, (NPRM),³ seeking comment on how to resolve this interference problem. The NPRM addressed Nextel's proposal and other proposals that sought to resolve the harmful interference problem. The Commission received over 2,200 filings in response to this NPRM.

On August 6, 2004, the Commission released a Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order⁴, in which it established a two-pronged solution to the interference problem. First, to more adequately address individual interference problems, the Commission adopted an objective technical standard for determining whether an 800 MHz public safety or other non-cellular licensee is entitled to interference protection in a given area. The Commission also established a set of procedures for expeditious resolution of interference.

The second prong of the solution, which is intended to address the identified root cause of the interference, involves a reconfiguration of the 800 MHz band, placing generally incompatible technologies in separate band segments. Under this band reconfiguration, many 800 MHz private land mobile (including public safety) and commercial mobile radio licensees will have to move to another part of the 800 MHz band. In general, Nextel will pay for all direct and indirect costs associated with the reconfiguration. The costs, however, must be reasonable, well documented and the minimum necessary to obtain comparable facilities for relocated incumbent licensees.

To ensure a smooth transition to the new 800 MHz band plan, the relocation process will be managed by an independent Transition Administrator (TA). The TA will oversee the administration and financial aspects of the band reconfiguration process and ensure that reconfiguration is achieved with minimal disruption to licensees, particularly public safety entities. On October 12, 2004, the Transition Administrator Search Committee (Search Committee) presented its selection of a team consisting of BearingPoint, Squires-Sanders-Dempsey, LLP and Baseline Technologies for Commission concurrence. In a Public Notice⁵ released October 29, 2004, the Commission approved the Search Committee's selection.

³ <http://wireless.fcc.gov/publicsafety/800MHz/bandreconfiguration/downloads/FCC-02-81A1.pdf>

⁴ <http://wireless.fcc.gov/publicsafety/800MHz/bandreconfiguration/downloads/FCC-04-168A1.pdf>

⁵ <http://wireless.fcc.gov/publicsafety/800MHz/bandreconfiguration/downloads/DA-04-3492A1.pdf>

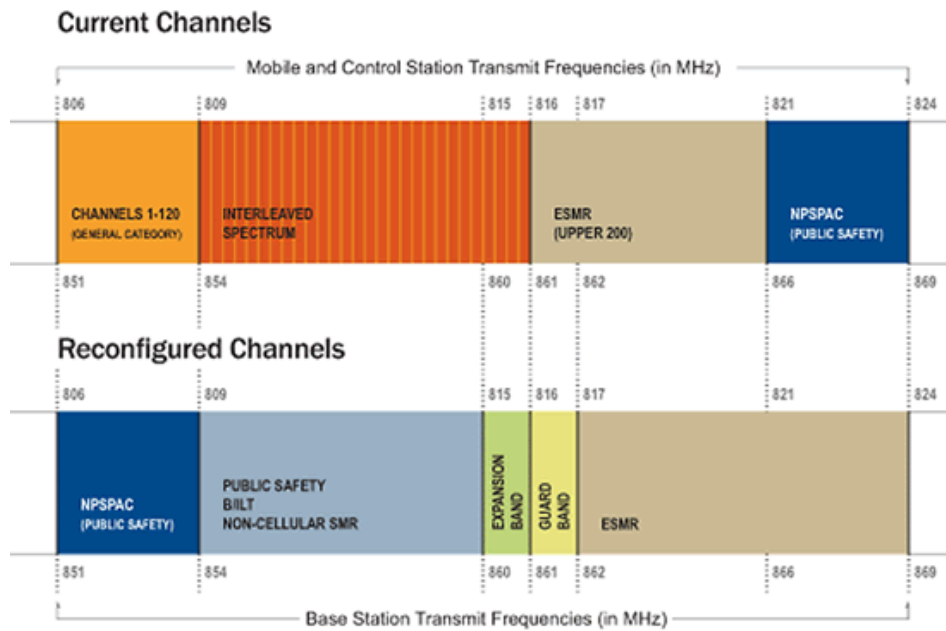


Figure 16: 800 MHz Band Spectrum

The band spectrum above represents the 800 MHz reconfiguration project. It aims to eliminate and avoid future interference to public safety radio systems by separating spectrum for commercial networks from spectrum for the “high-site” radio networks typically used by public safety groups. This requires moving public safety systems to a spectrum lower in the 800 MHz band, and moving commercial carriers such as Nextel to the opposite end of the band. The planned reconfiguration of the 800 MHz band also includes creating a “guard band” or buffer to help ensure that signals from the different types of networks will not interfere with each other. It is estimated that the reconfiguration process for the entire U.S. will take three years to complete.

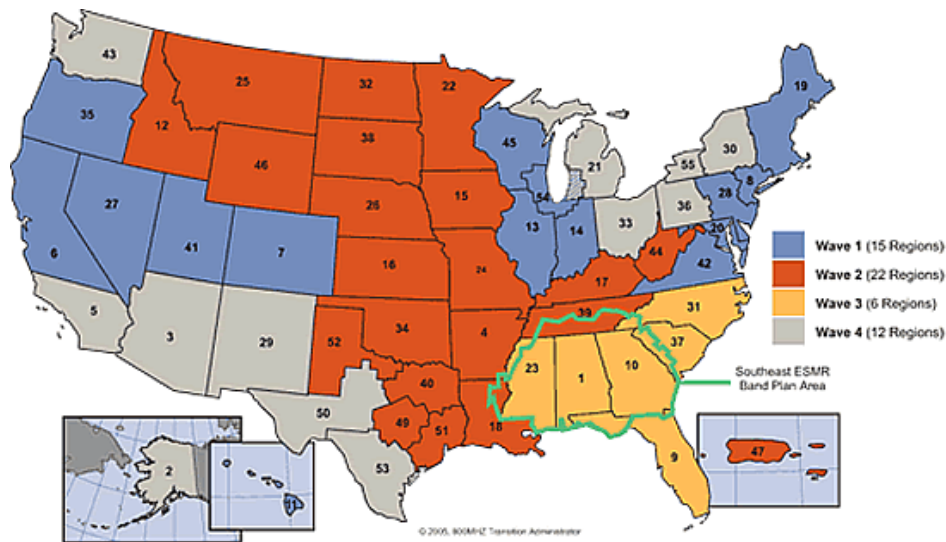


Figure 17: 800 MHz Rebanding Waves

Virginia is in Wave I of the rebanding implementation schedule, which means our entire public safety band will be moved within the first year of the project.

If you have questions or concerns about Virginia's 800 MHz rebanding implementation, contact VITA's David Warner at (804) 371-5212 or david.warner@vita.virginia.gov.

Interoperability Channels

The FCC has designated several frequencies as primary status for interoperable communications within VHF and UHF. These frequencies can be used on a non-routine basis for interoperable communications between any local or state entity. Additionally, these channels can be used across interstate borders with neighboring public safety jurisdictions.

VHF High Band (150-174 MHz)

151.1375 base/mobile	VTAC 1
154.4525 base/mobile	VTAC 2
155.7525 base/mobile	VCALL
158.7375 base/mobile	VTAC 3
159.4725 base/mobile	VTAC 4

UHF High Band (450-470 MHz)

453.2125 base/mobile	UCALLa
458.2125 base/mobile	UCALL
453.4625 base/mobile	UTAC 1a
458.4625 base/mobile	UTAC 1
453.7125 base/mobile	UTAC 2a
458.7125 mobile	UTAC 2
453.8625 base/mobile	UTAC 3a
458.8625 mobile	UTAC 3

Note—Additional maritime frequencies may be available under certain circumstances per guidelines set forth in FCC 00-348A1, Paragraphs 94 &95.

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Narrowbanding

| Coming soon

National Incident Management System

In Homeland Security Presidential Directive (HSPD)-5, *Management of Domestic Incidents*, the President directed the Department of Homeland Security (DHS) to develop and administer the National Incident Management System (NIMS). NIMS provides a consistent nationwide approach for Federal, State, territorial, tribal, and local governments to work effectively and efficiently together to prepare for, prevent, respond to, and recover from domestic incidents, regardless of cause, size, or complexity. On March 1, 2004, DHS issued NIMS to provide a comprehensive national approach to incident management, applicable at all jurisdictional levels and across functional disciplines.

Many of the NIMS requirements are specific to local jurisdictions. In order for NIMS to be implemented successfully across the nation, it is critical that States provide support and leadership to tribal and local entities to ensure full NIMS implementation. On November 1, 2005 Governor Warner signed Executive Order 102 requiring the adoption of the NIMS and use of the National Preparedness Goal for preventing, responding to and recovering from crisis events in the Commonwealth. NIMS has been adopted nationally and is being implemented in Virginia as the federally required incident management system. To achieve this goal, the Executive Order places the State Coordinator of the Virginia Department of Emergency Management as the responsible party for NIMS implementation.

An important point of the Executive Order is its requirement that “all emergency plans and procedures shall be developed in consonance with NIMS, the National Response Plan and in accordance with the National Preparedness Goals.” The CICO will continue to address the requirement in FY 2007 by building on the common language protocols and standards efforts of FY 2006 through Initiatives 11 and 12 that state: “Encourage adoption of the common language best practice on the local, state and federal level” and “In support of National Incident Management System (NIMS) implementation across the Commonwealth, endorse the Communications Unit Leader (COML) concept and encourage NIMS certification” respectively. For more information on the Commonwealth’s effort regarding NIMS, please contact Chris Essid at Chris.Essid@governor.virginia.gov.

For detailed information on NIMS or for an on-line training course please visit the NIMS website at: www.nimsonline.com.

NIJ CommTech Program

Mission

The National Institute of Justice's (NIJ) CommTech Program has a mission to assist State and local law enforcement agencies to effectively and efficiently communicate with one another across agency and jurisdictional boundaries. Identical to the mission of NIJ who's goal is to provide objective, independent, evidence-based knowledge and tools to meet the challenges of crime and justice, particularly at the State and local levels.

NIJ's principal authorities are derived from the Omnibus Crime Control and Safe Streets Act of 1968, as amended (see 42 USC § 3721-3723) and Title II of the Homeland Security Act of 2002.

Interoperability Solutions

Interoperability is one of the areas of interest that is addressed by CommTech's Technology Working Group (TWG) through its technology requirements. The TWG is a group of active, sworn law enforcement officers that meet twice a year to provide guidance and requirements to the CommTech program office.

CommTech is helping bridge the gap in emergency communication by providing grants that identify, adopt, and develop interoperability solutions that include research in software defined radio and cognitive radio technology, cellular and broadband wireless technologies, and personnel location services.

Through its outreach and technology assistance programs, CommTech assists law enforcement agencies with various interoperability issues. Also, the team is able to raise the awareness of interoperability issues so that policymakers and public safety leaders can make informed and cost-effective decisions.

Interoperability is an issue that affects us all. Through CommTech, the National Institute of Justice is hoping to improve public safety communication before it's too late. Improved interoperability will save lives, and CommTech is making sure it does. Many of the Commonwealth's local interoperability demonstration projects are funded out of the NIJ Interoperability Grant that resulted from a Congressman Wolfe Earmark.

To learn more concerning NIJ CommTech, please visit the website at <http://www.ojp.usdoj.gov/nij/topics/commtech/>

Project 25 Suite of Standards

What is Project 25?

Efforts to develop industry-wide standards have been underway since the late 1980's. Project 25 (P25) is an industry-wide effort to develop a voluntary standard for uniform digital two-way radio for public safety organizations.⁶ P25 Standards are a benchmark in Public Safety Radio Communications for First Responders. P25 is defined in the published ANSI/TIA102 documents enabling migration from today's radio systems to desired levels of interoperability directly impacting first responders. It is the first standard of its kind, driven by users, to allow graceful, scalable migration to standards based interoperable systems.

Why is P25 relevant now?

The events in the United States and around the world since September 11, 2001 have spurred popular interest in Public Safety communications interoperability. Growing concern has driven many country's governments - including the US Federal Government - to reorganize to create focused positions to address Homeland Security. Long before these events, Public Safety and the land-mobile radio industry created an interoperability solution. Published by TIA and approved by Federal, State/Province and Local Public Safety users, the P25 standards enable a feature-rich, scalable digital radio technology. The availability of radio equipment compliant to P25 standards is now providing a basis for conventional radio communications interoperability that is necessary for First Responders.

Is P25 an accepted standard now?

The P25 standard has been adopted by the National Telecommunications and Information Administration (NTIA), which manages spectrum for the federal government. In addition, NTIA also specified use of P25 narrow band by the year 2005 for the VHF Hi bands (162-174 MHz), and by 2008 for all other bands. Many US government agencies (e.g. Treasury, Interior, Departments of Defense (DoD) and Justice) have specified P25 for procurements of new radio communications systems and equipment.

P25 compatibility has become a significant purchasing factor for users of state and local public safety and public service radio communication systems. As state and local Public Safety users change or upgrade their existing analog systems to comply with new FCC regulated bandwidths, demand for P25 compliant digital public safety systems increases. This is partly due to the ability of P25 systems to be configured for compatibility with older analog mobile and portable radios,

⁶ Project 25 – An APCO International project to develop interoperable communications standards for public safety digital mobile radio systems; AFC (Automated Frequency Coordination) – APCO International. Accessed at <http://www.apcointl.org/frequency/project25>.

allowing adopters of the P25 standard to purchase new system equipment without replacing all of their subscriber radios.

The 8 Interfaces:

A commonly misunderstood aspect of P25 is that it is comprised of a single standard. Instead, it is a suite of standards that specify the eight interfaces between the various components of a land mobile radio system (hand held to hand held, hand held to mobile unit, mobile unit to repeater, etc.):

- 1) **Common air interface:** This interface defines the wireless access between mobile and portable radios, and between the subscriber (portable and mobile) radios and the fixed or base station radios;
- 2) **Subscriber data peripheral interface:** This interface characterizes the signaling for data transfer that must take place between the subscriber radios and the data devices that may be connected to the subscriber radio;
- 3) **Fixed station interface:** This interface describes the signaling and messages between the RFSS and the fixed station by defining the voice and data packets (that are sent from/to the subscriber(s) over the common air interface) and all of the command and control messages used to administer the fixed station as well as the subscribers that are communicating through the fixed station;
- 4) **Console interface:** This interface is similar to the fixed station interface but it defines all the signaling and messages between the RFSS and the console, the position that a dispatcher or a supervisor would occupy to provide commands and support to the personnel in the field;
- 5) **Network management interface:** This interface to the RFSS allows administrators to control and monitor network fault management and network performance management;
- 6) **Data network interface:** This interface describes the RF subsystem's connections to computers, data networks, external data sources, etc.;
- 7) **Telephone interconnect interface:** This interface between the RFSS and the Public Switched Telephone Network (PSTN) allows field personnel to make connections through the public switched telephone network by using their radios rather than using cellular telephones;
- 8) **Inter RF subsystem interface:** This interface permits users in one system to communicate with users in a different system, from one jurisdiction to another, from one agency to another, from one city to another, etc.

Figure 18 below demonstrates how the P25 Suite of Standards will interact.

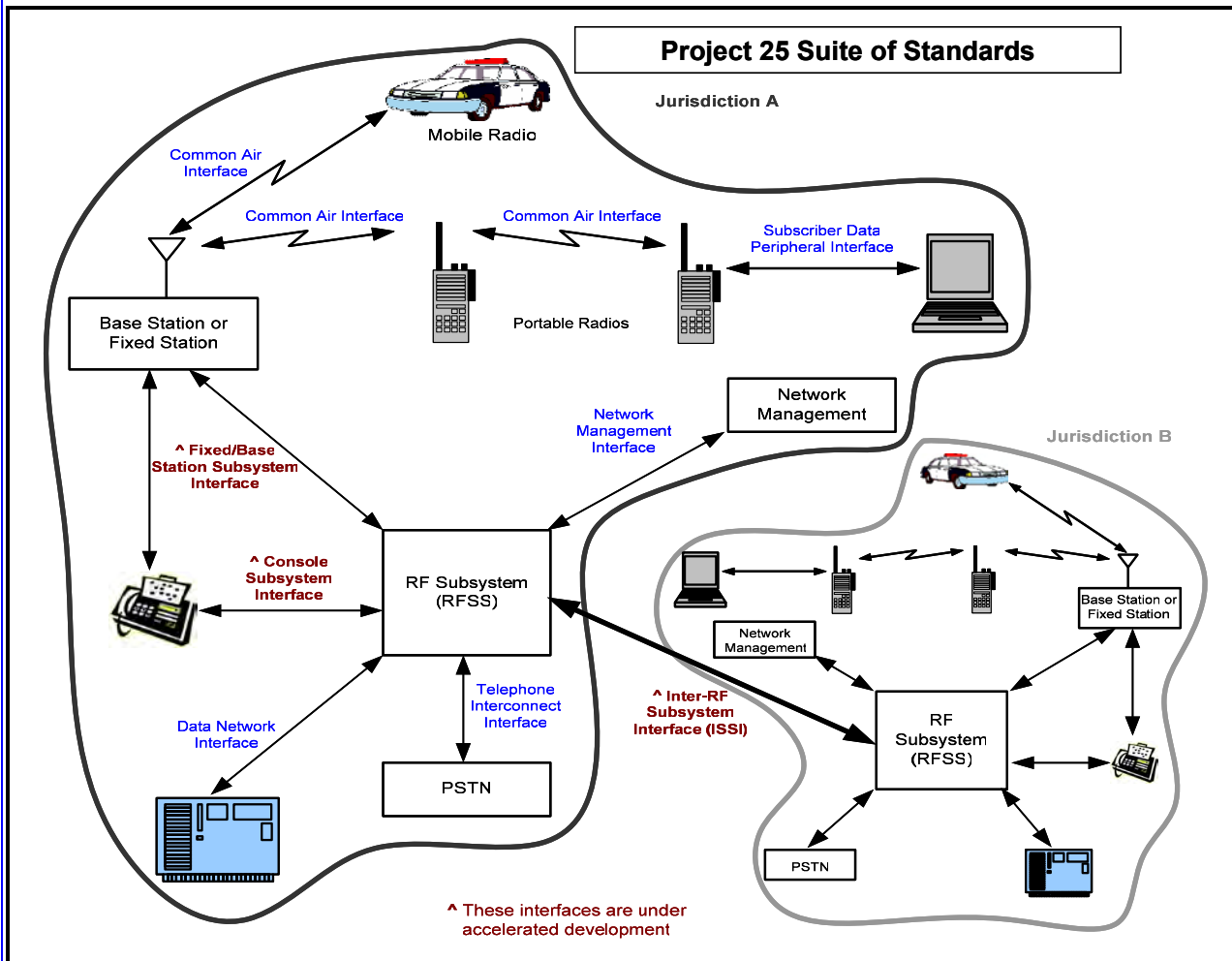


Figure 18: P25 Suite of Standards Interaction

Until this past January, the last fifteen years had resulted in only one of the above P25 interfaces, the Common Air Interface that deals with the functions of the hand held units (i.e., walky-talky), being advanced to a level where it would help satisfy one or both of the goals of P25. The remainder of the interfaces had either remained undefined, or lacked enough specificity to allow for a common implementation of the interface; in other words each manufacturer's implementation of the interface would be different and proprietary thus resulting in systems that would not meet "interoperability" requirements.

P25 Compliance Assessment Program

Public safety demands that equipment claiming to be P25 compliant — or generally capable of its manufacturer's claims — will communicate with other

P25 radios. Unfortunately this is not often the case. Initial testing shows that often one manufacturer's "P25-compliant radio" will not communicate with another manufacturer's "P25-compliant radio." The National Institute of Standards and Technology (NIST) is currently addressing this issue by developing a P25 conformance testing program in partnership with SAFECOM to ensure equipment meet the new P25 standards. NIST, in cooperation with technical representatives from the Institute for Telecommunication Sciences (ITS) and industry representatives, has established a framework for the program and is moving into the first stage of testing. The safety of emergency responders will be enhanced when industry's claims of P25 compliance can be measured objectively and independently. This initiative will also ensure federal grant dollars are being used appropriately to purchase equipment that is truly P25 compliant.⁷

The Future State

Over the last year, through the concerted efforts of industry, public safety practitioners, and NIST, and the support of SAFECOM, the technical development of standards for the critical P25 interfaces has been greatly accelerated. Industry representatives, with key involvement by public safety practitioners, have dramatically increased the pace and scope of their standards development activities consistent with priorities set by Congress.

As a result, significant progress has been made through the formal P25/Telecommunications Industry Association (TIA) standards development framework established by the P25/TIA partnership in 1993. Specifically, the most critical P25 radio system interfaces have all been addressed. Basic protocol standards that specify the functionality and capability of these interfaces have now been completed and have been, or are on the verge of being published. The adoption of P25 standards is now occurring within a time frame acceptable to public safety users, NIST and its Federal partners, and the manufacturers.

As of the March 2006 the following has been achieved to add to the existing P25 Common Air Interface:

- **Inter-RF Subsystem Interface (ISSI):** On May 31, 2006 the TIA unanimously voted in favor of publishing the ISSI Messages and Procedures documents. The next step is for the TIA to formally publish this TIA standard during 2007. The public safety community can expect ISSI products to be available in 2007 (within approximately six months after publication of relevant standards in 2006 consistent with deadlines established by the P25 Steering Committee).
- **Fixed/Base Station Subsystem Interface (FSSI):** A completed FSSI standard was approved on January 11, 2006 for publication as a TIA standard. The realization of a TIA standard for the FSSI is extremely

⁷ Boyd, David. U.S. Department of Homeland Security-Office for Interoperability and Compatibility (April 2006). Report to the Committee on Homeland Security -Subcommittee on Emergency Preparedness, Science, and Technology. Washington, DC. <http://hsc.house.gov/files/TestimonyBoyd.pdf>.

important because this standard will result in the offering and procurement of interoperable multi-vendor equipment enabling direct control by the console and Radio Frequency Subsystem (RFSS) of fixed/base station equipment. The console functionality provided by the FSSI substantially mitigates the urgency for completion of the CSSI. The public safety community can expect FSSI products to be available in late 2006 (within approximately six months after publication of relevant standards in 2006 consistent with deadlines established by the P25 Steering Committee).

- **Console Subsystem Interface (CSSI):** Completion in January 2006 of a new TIA standard for the FSSI that enables direct basic console control of fixed/base station equipment now serves as the foundation for more comprehensive CSSI standards to be developed in the future. Further development of the CSSI will follow, upon continued development of the ISSI and FSSI throughout calendar year 2006. The public safety community can expect CSSI products to be available in 2007 (within approximately six months after publication of relevant standards in 2006 consistent with deadlines established by the P25 Steering Committee).
- **National Voluntary Laboratory Accreditation Program:** NIST, with the support of SAFECOM and the P25 Steering Committee, is developing a P25 Conformity Assessment Program. NIST is preparing and documenting standardized test protocols for the most important aspects of the Common Air Interface Standard. The standardized test protocols will then be provided to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), which can accredit laboratories interested in offering these testing capabilities. These test protocols would go a long way in assuring the public safety community that the equipment being purchased meets the P25 standard.

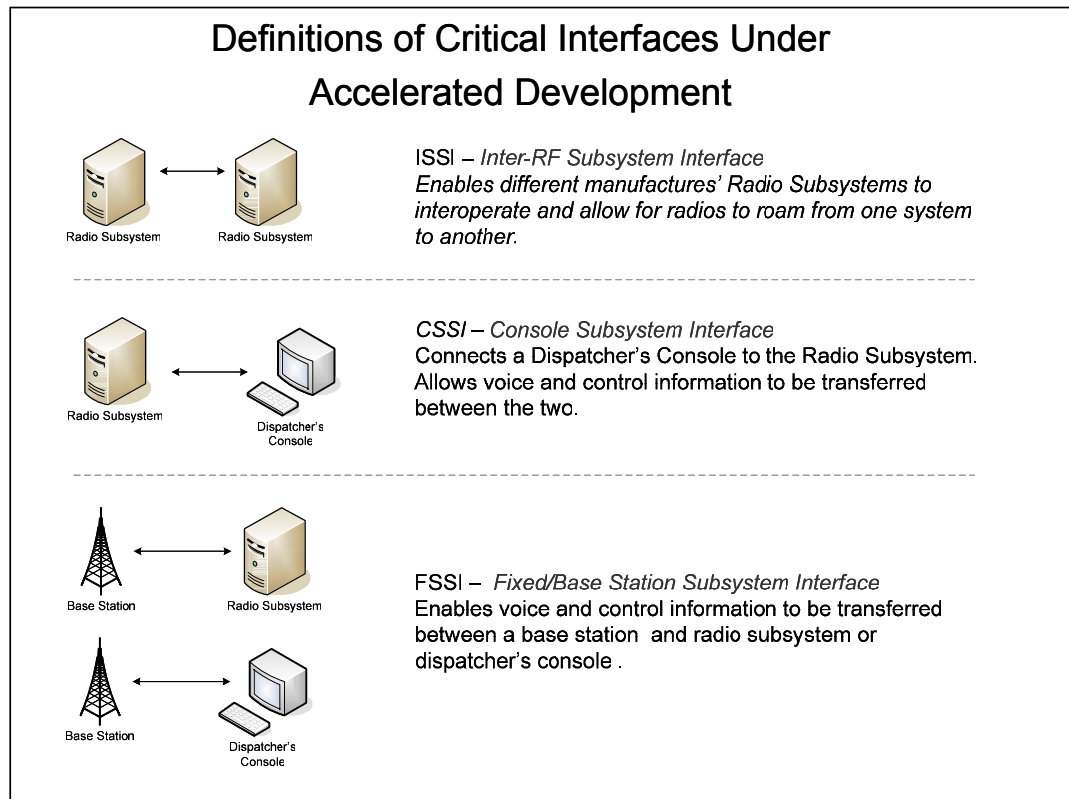


Figure 19: P25 Interfaces Under Accelerated Development

Conclusion

There are positive steps being taken by leaders within the public safety community, key federal programs, the Congress and industry to significantly change the current environment and move the state of standards for public safety forward. The last twelve months has seen significant progress in the development of critical P25 standards and the next twelve months will see even more progress made. In addition, by mid FY 2007, local, state, and federal agencies procuring P25 equipment will have a mechanism in place to ensure that the products they are purchasing truly do what is called for in the applicable standard.³

³ Orr, Dereck. U.S. Department of Commerce- National Institute of Standards and Technology Administration. (April 2006). Report to the Committee on Homeland Security -Subcommittee on Emergency Preparedness, Science, and Technology. "The State of Interoperability: Perspectives on Federal Coordination of Grants, Standards, and Technology." Washington, DC. <http://www.nist.gov/>

SAFECOM Program

Background on Public Safety and Wireless Communications

Inadequate and unreliable wireless communications have been issues plaguing public safety organizations for decades. In many cases, agencies cannot perform their mission-critical duties. These agencies are unable to share vital voice or data information via radio with other jurisdictions in day-to-day operations and in emergency response to incidents including acts of terrorism and natural disasters.

According to a report published by the National Task Force on Interoperability (February 2003), the public safety community has identified the following key issues that hamper public safety wireless communications:

- Incompatible and aging communications equipment
- Limited equipment standards
- Limited and fragmented radio spectrum
- Limited and fragmented planning and coordination
- Limited and fragmented budget cycles and funding

In short, the Nation is heavily invested in an existing infrastructure that is largely incompatible. The SAFECOM Program was established by the Office of Management & Budget and approved by the President's Management Council to address the public safety communications issues identified above.

The SAFECOM Program

SAFECOM, a communications program of the Department of Homeland Security's Office for Interoperability and Compatibility (OIC), works with its federal partners to provide research, development, testing, evaluation, guidance, tools, and templates on communications-related issues to local, state, and federal public safety agencies. OIC is managed by the Science and Technology Directorate's Office of Systems Engineering and Development.

SAFECOM, a public safety practitioner-driven program, is working with existing federal communications initiatives and key public safety stakeholders to address the need for better technologies and processes for the cross-jurisdictional and multi-disciplinary coordination of existing systems and future networks. SAFECOM harnesses diverse federal resources in service of the public safety community. The scope of this community is broad, including more than 60,000 local and state public safety agencies and organizations. Federal customers include agencies engaged in public safety disciplines such as law enforcement, firefighting, public health, and disaster recovery, as well as federal agencies that provide funding and support to state and local public safety agencies. SAFECOM makes it possible for the public safety community to leverage resources by promoting coordination and cooperation across all levels of government.

SAFECOM's Near-Term Initiatives

- Develop a process to advance standards that improve public safety communications interoperability
- Develop and disseminate grant guidance for all agencies providing grants for public safety communications and interoperability

- Provide tools and models for communications and interoperability training and technical assistance
- Create a one-stop shop for public safety communications and interoperability
- Develop, test, and evaluate technologies for public safety communications and interoperability

SAFECOM'S Long-Term Goals

- Achieve a systems-of-systems environment supported by communications standards, tools, and best practices
- Facilitate coordination of funding assistance through tailored grant guidance to maximize limited resources available for public safety communications and interoperability
- Pilot tools and methods as national models for public safety at the rural, urban, state, and/or regional levels
- Provide policy recommendations to promote efficiency in public safety communications⁸

SAFECOM's Current Efforts

Tool Development

SAFECOM is developing a step-by-step, how-to guidebook for writing major Requests for Proposals (RFP) that will radically simplify the often cumbersome local and state procurement processes and ensure compatibility with SAFECOM's national strategy.

National Interoperability Baseline Initiative

A baseline is crucial to assess the maturity of operational, governance, and technical considerations for interoperable communications; identify capability gaps; and direct Federal investments as well as future SAFECOM initiatives. In FY 2007, SAFECOM will administer a National Interoperability Baseline survey to 23,000 public safety agencies to measure the current state of interoperable communications capabilities across the nation. The results of the survey will provide the first quantitative assessment of public safety's interoperable communications capabilities.

Statement of Requirements

SAFECOM is currently developing version 2.0 of the Public Safety Statement of Requirements (for an early FY 2007 release) which will begin to incorporate quantitative values for the requirements (presented in versions 1.0 and 1.1 released previously). Version 2.0 will quantify the requirements for the most important applications identified by the public safety community: mission-critical voice, and emerging technologies for tactical video. Version 2.0 will also help industry to develop equipment that meets the new public safety requirements.⁹

To learn more concerning the SAFECOM Program, please visit the website at www.safecomprogram.gov.

⁸ SAFECOM Program One-Pager.

⁹ Boyd, David. U.S. Department of Homeland Security-Office for Interoperability and Compatibility (April 2006). Report to the Committee on Homeland Security -Subcommittee on Emergency Preparedness, Science, and Technology. Washington, DC. <http://hsc.house.gov/files/TestimonyBoyd.pdf>.

Appendices

Appendix A: Additional Resources

Virginia Interoperability Web Page

- www.interoperability.publicsafety.virginia.gov

Federal Interoperability General Information

- AGILE Program (www.ojp.usdoj.gov)
- Joint Tactical Radio System (<http://jtrs.army.mil>)
- GAO Report on interoperable communications (www.gao.gov/new.itmes/d04740.pdf)
- National Incident Management System (NIMS) training (<http://training.fema.gov/EMIWEB/IS/is700.asp>)
- National Law Enforcement and Corrections Technology Center (www.nlectc.org)
- SAFECOM (www.safecomprogram.gov)
- National Institute of Standards and Technology (www.nist.gov)
- SEARCH (www.search.org)

State Partners

- Virginia Department of Criminal Justice Services (<http://www.dcjs.virginia.gov/>)
- Virginia Department of Emergency Management (www.vdem.state.va.us)
- Virginia Department of Fire Programs (www.vdfp.state.va.us)
- Virginia Department of Forestry (<http://www.dof.virginia.gov/>)
- Virginia Department of Game and Inland Fisheries (<http://www.dgif.virginia.gov/>)
- Virginia Department of Health (<http://www.vdh.state.va.us/>)
- Virginia Department of Rail and Public Transportation (<http://www.drpt.state.va.us/>)
- Virginia Department of Transportation (http://www.virginiadot.org/default_flash.asp)
- Virginia National Guard (<http://www.virginiaguard.com/>)
- Virginia Office of Commonwealth Preparedness (www.commonwealthpreparedness.virginia.gov)
- Virginia Office of the Secretary of Public Safety (<http://www.publicsafety.virginia.gov/index.cfm>)
- Virginia Office of the Secretary of Technology (<http://www.technology.virginia.gov/>)
- Virginia Port Authority (<http://www.vaports.com/>)
- Virginia STARS (www.publicsafety.virginia.gov/Initiatives/STARS.cfm)
- Virginia State Firefighters Association (<http://www.vsfa.org/>)

- Virginia State Police (www.vsp.state.va.us)

Local Public Safety Organizations

- Hampton Roads Planning District Commission (<http://www.hrpdc.org/>)
- Metropolitan Washington Airport Authority (<http://www.metwashairports.com/>)
- Virginia Association of Chiefs of Police (www.vachiefs.org)
- Virginia Association of Counties (<http://www.vaco.org/>)
- Virginia Association of Governmental EMS Administrators (www.vagemsa.org)
- Virginia Association of Public Safety Communications Officials (<http://www.virginia-apco.org/>)
- Virginia Association of Volunteer Rescue Squads (<http://www.vavrs.com/default2.cfm>)
- Virginia Fire Chiefs Association (www.sfcav.org)
- Virginia Hospital and Healthcare Association (<http://www.vhha.com/>)
- Virginia Information Technologies Agency (<http://www.vita.virginia.gov/>)
- Virginia Municipal League (<http://www.vml.org/>)
- Virginia Professional Firefighters Association (<http://www.vpff.org/>)
- Virginia Sheriffs' Association (www.virginiasheriffs.org)
- Virginia Wireless E-911 Services Board (<http://www.911.virginia.gov/index.html>)

Grants Information

- Access to Federal Grant Opportunities (<http://www.grants.gov/>)
- Department of Homeland Security (www.dhs.gov/dhspublic/display?theme=18)
- National Institute of Justice (<http://www.ojp.usdoj.gov/nij/funding.htm>)
- Office of Community Oriented Policing Services (www.cops.usdoj.gov)
- Office of Domestic Preparedness (www.ojp.usdoj.gov/odp/grants_programs.htm)

Communications Spectrum

Federal agencies that manage the commercial and public communications spectrum:

- Federal Communications Commission (<http://wireless.fcc.gov/publicsafety>)
- National Telecommunications and Information Administration (www.ntia.doc.gov)

Technology and Standards Information

Standards bodies working to promote interoperable communications technology:

- Association of Public-Safety Communications Officials, International (www.apcointl.org)
- Capital Wireless Information Net (CapWIN) (www.capwin.org)
- Institute of Electrical and Electronics Engineers (www.ieee.org)
- International Telecommunication Union (www.itu.int)
- National Institute of Justice's Technology Programs (www.ojp.usdoj.gov/nij/sciencetech)
- National Institute of Standards and Technology (www.nist.gov)
- Project 25 (www.project25.org)
- Project Mobility for Emergency and Safety Applications (MESA) (www.projectmesa.org)
- Telecommunications Industry Association (www.tiaonline.org)

Appendix B: Glossary of Terms and Acronyms

Glossary of Terms¹⁰

Analog: A signal that may vary continuously over a specific range of values.

Band*: the spectrum between two defined limited frequencies. For example, the Ultra High Frequency (UHF) is located from 300 MHz to 3,000 MHz in the radio frequency spectrum.

Bandwidth: The range within a band of frequencies; a measure of the amount of information that can flow through a given point at any given time.

Block grant: Federal grant funding that is allocated to state and localities based on a pre-determined statutory formula.

Channel*: A single unidirectional or bidirectional path for transmitting or receiving, or both, of electrical or electromagnetic signals.

Communications interoperability: The ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, when needed, and as authorized.

Communications system*: A collection of individual communication networks, transmission systems, relay stations, tributary stations, and data terminal equipment usually capable of interconnection and interoperation to form an integrated whole. The components of a communications system serve a common purpose, are technically compatible, use common procedures, respond to controls, and operate in unison.

Coverage*: The geographic area included within the protected range of a wireless radio system based upon their FCC licenses.

Cycle: One complete performance of a vibration, electrical oscillation, current alternation, or other periodic process.

Digital: Voice communication occurs as an analog signal; that is, a signal with a voltage, frequency, or phase level that continuously varies. Digital signals at baseband occur as the presence or absence of electronic pulses, often representing only one or many values. Voice transmissions may be sent over

¹⁰ Terms marked with an asterisk (*) are as defined in the National Task Force on Interoperability (NTFI) "Why Can't We Talk? Working Together To Bridge the Communications Gap To Save Lives," February 2003.

digital radio systems by sampling voice characteristics and then converting the sampled information to a digital format.

Discretionary grant: Federal grant funding distributed at the discretion of the agency administering the program funding, usually through a competitive process.

First responders: Individuals who in the early stages of an incident are responsible for the protection and preservation of life, property, evidence, and the environment, including emergency response providers, as well as emergency management, public health, clinical care, public works, and other skilled support (such as equipment operators) that provide immediate support services during prevention, response, and recovery operations.¹¹

Formula grant: Federal grant that is allocated based on a predetermined statutory formula.

Frequency*: The number of cycles or events of a periodic process in a unit of time.

Frequency bands*: Where land mobile radio systems operate in the United States, including:

High HF	25-29.99 MHz
Low VHF	30-50 MHz
High VHF	150-174 MHz
Low UHF	450-470 MHz
UHF TV Sharing	470- 512 MHz
700 MHz	764-776/794-806 MHz
800 MHz	806-869 MHz

Grant: Funding made available to local agencies from State and Federal government agencies, as well as from private sources, such as foundations. Grants usually require the submission of a formal application to justify one's funding request.

Hertz: Abbreviation for cycles per second.

Infrastructure*: The hardware and software needed to complete and maintain the radio communications system.

Interference*: Extraneous energy, from natural or man-made sources, that impeded the reception of desired signals.

¹¹ First Responder as defined the December 17, 2003 Homeland Security Presidential Directive/HSPD-8, Subject: National Preparedness

Jurisdiction: The territory within which power or authority can be exercised.

Locality: A particular neighborhood, place, or district.

Local revenue fund: Funding obtained by local governments through local taxes (e.g. sales tax, property tax), user fees, and other user charges, as well as through the issuing of debt instruments, such as bonds.

Modem: An acronym for modulator/demodulator, which is a device that translates digital signals coming from a computer into analog signals that can be transmitted over standard telephone lines. The modem also translates the analog signal back into a digital signal that a computer can understand.

Mutual aid: The mutual aid mode describes major events with large numbers of agencies involved, including agencies from remote locations. Mutual aid communications are not usually well planned or rehearsed. The communications must allow the individual agencies to carry out their missions at the event, but follow the command and control structure appropriate to coordinate the many agencies involved with the event.

Mutual aid channel: A radio channel specifically allocated for use during emergency mutual aid scenarios.

Narrow-banding: Generally, narrowband describes telecommunication that carries voice information in a narrow band of frequencies. For state and local public safety, narrow-banding typically refers to the process of reducing the useable bandwidth of a public safety channel from 25 kHz to 12.5 kHz. The FCC issued the migration of Private Land Mobile Radio systems using frequencies in the 150-174 MHz and 421-512 MHz bands to narrowband technology. These rules set deadlines on applications for new wideband systems, modifications of existing wideband systems, manufacture and importation of 25 kHz equipment, the requirement for public safety to migrate to 12.5 kHz systems by January 2018.

Receiver: The portion of a radio device that converts the radio waves into audible signals.

Refarming: An administrative process being conducted by the FCC to reallocate channel bandwidths and, as a result, promote spectrum efficiency.

Repeater: In digital transmission, equipment that receives a pulse train, amplifies it, retimes it, and then reconstructs the signal for retransmission; in fiber optics, a device that decodes a low-power light signal, converts it to electrical energy, and then retransmits it via an LED or laser source. Also called a “regenerative repeater”.

Spectrum: The region of the electromagnetic spectrum in which radio transmission and detection techniques may be used.

Spectrum efficiency: The ability to optimize the amount of information sent through a given amount of bandwidth.

Steering committee: A group of usually high-level officials charged with setting policy for a project.

Supplemental responders: Responders who provide support to first responders during incidents requiring special assistance. Supplemental responders include:

- Emergency Management: Public protection, central command and control of public safety agencies during emergencies
- Environmental Health/Hazardous Materials specialists: environmental health personnel
- Homeland Security and Defense units
- Search and Rescue teams
- Transportation personnel

Transmitter: The portion of a radio device that sends out the radio signal.

Trunked radio system*: A system that integrates multiple channel pairs into a single system. When a user wants to transmit a message, the trunked system automatically selects a currently unused channel pair and assigns it to the user, decreasing the probability of having to wait for a free channel for a given channel loading.

Acronyms

AMPS: Advanced Mobile Phone System
APCO: Association of Public Safety Communication Officials
CAPRAD: Computer Assisted Pre-Coordination Resource and Database System
CapWIN: Capital Area Wireless Information Net
CASM: Communications Assets Survey and Modeling
CIC: Commonwealth Interoperability Coordinator
CICO: Commonwealth Interoperability Coordination Office
COML: Communications Unit Leader
COMLINC: Commonwealth's Link to Interoperable Communications
CPWG: Commonwealth Preparedness Working Group
DOJ: Department of Justice
DHS: Department of Homeland Security
EDXL: Emergency Data Exchange Language
FCC: Federal Communications Commission
HF: High Frequency
IAT: Initiative Action Team
ICR: Incident Command Response
ICRI: Incident Commander's Radio Interface
ICTAP: Interoperability Communications Technical Assistance Program
kHz: Kilohertz (1 thousand cycles per second)
MHz: Megahertz (1 million cycles per second)
NENA: National Emergency Numbers Association
NIJ: National Institute of Justice
NIMS: National Incident Management System
NPSPAC: National Public Safety Advisory Committee
OCP: Office of Commonwealth Preparedness
P25: Project 25 Suite of Standards
PLMR: Private Land Mobile Radio
PMO: Project Management Office
SCP: Secure Commonwealth Panel
SIEC: State Interoperability Executive Committee
SIRS: Statewide Interdepartmental Radio System
SPS: Office of the Secretary of Public Safety
STARS: Statewide Agencies Radio System
SWAN: State Wide Alert Network
UHF: Ultra High Frequency
VHF: Very High Frequency
VACP: Virginia Association of Chiefs of Police
VAGEMSA: Virginia Association of Governmental EMS Administrators
VBMP: Virginia Base Mapping Program
VDEM: Virginia Department of Emergency Management
VDFP: Virginia Department of Fire Programs
VDH: Virginia Department of Health
VDOT: Virginia Department of Transportation

VFCA: Virginia Fire Chiefs Association
VGIN: Virginia Geographic Information Network
VITA: Virginia Information Technology Agency
VoIP: Voice over Internet Protocol
VPFF: Virginia Professional Fire Fighters
VSA: Virginia Sheriffs' Association
VSP: Virginia Department of State Police

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